



***Beat the heat with PORT-A-COOL®***



Life's Cool Europe, s.l.  
Diputació, 475, bjs. // 08013-Barcelona  
T-93 231 28 10 // Fax – 93 231 14 76

### **History of evaporative cooling**

The ancient Egyptians, Greeks and Romans used *wet mats* (what we could call cooling pads today) to cool indoor air. They hung the mats over the doors of their tents and other dwellings. When wind blew through the mats, evaporation of the water cooled the air inside. The people of India used this method to cool the royal palaces.

During the 1500's the first mechanical fans was build to provide ventilation. In 1800, textile manufacturers in New England began using water evaporative systems to condition the air in their mills. The system consisted of large 'cooling towers' with fans that transported the watercooled air inside building.

### **What is evaporative cooling?**

Remember swimming on a hot, dry day, then getting out of the water and feeling the chill of the wind hitting your wet skin? Or simply try dipping your finger in a glass of water, then blowing air across your finger and feeling the cool sensation as the water evaporates. That's evaporative cooling.

Try the same thing when there is no wind or no air moving. The surrounding air is quickly saturated with moisture, there is no evaporation and the cooling effect is gone.

Evaporative cooling units create this naturally occurring process and provide a constant flow of cool, refreshing air into a hot, uncomfortable environment.

### **History PORT-A-COOL® / LC-Europe**

PORT-A-COOL® is an amazing new product, fully developed in 1992, which offers many exciting versatile options for cooling when standard air-conditioning may be unavailable, impractical or cost prohibitive.

The PORT-A-COOL® headoffice is based in Texas, where also all the machines are manufactured. PORT-A-COOL® expanded rapidly throughout the world. Selling almost 30.000 PORT-A-COOL@s a year worldwide.

Since the beginning of 2007 PORT-A-COOL® started their own European headoffice, called Life's Cool Europe. This headoffice is based in Barcelona, with another office in the Netherlands. From Barcelona where the European warehouse is based, the whole of Europe and Northern Africa is supplied.

### **How does it work?**

The heart of an evaporative cooling system is the pad where the water evaporates and the air passing through the pads is cooled.

Evaporative cooling pads, like K  l pads, are manufactured of fluted cellulose sheets that are glued together. This material is chemically impregnated with special compounds to prevent rot and ensure a long service life. A special water distribution system spreads water over the surface of the pad, ensuring a uniform supply of water to keep the entire air contact surface thoroughly wetted.

Fans create a negative pressure, causing air to be drawn through the pads.



Evaporation results from contact between air and water. A control system operates the water pump and the fan distributes the cool air.

The relative humidity is lowest in the afternoon when the temperature is at its highest. And the lower the humidity, the better the evaporative cooling effect. In other words, the cooling effect is best when you need it most.

### **Humidity**

A given volume of air at a certain temperature and pressure has the ability to absorb and hold a certain amount of water vapor. If that volume of air contains 50% of the amount of moisture that it is capable of holding, it is said to be at 50% relative humidity. The higher the temperature of the air, the higher the amount of moisture it is capable of holding. Any change in the temperature without a corresponding change in the pressure results in an increase or decrease in the amount of water vapor the air can hold.

The hotter the day, the drier the air becomes, and the more cooling that can take place through the evaporation of water. This means that when the day gets hot enough to require cooling, the relative humidity will be much lower than in the morning and will allow an evaporative cooling device to work more effectively.

Approximately 2% to 5% increase in humidity is produced depending on the temperature and humidity of the environment. This amount of increase in humidity is not noticeable in a ventilated area where the air produced by the unit is exhausted

### **The PORT-A-COOL® Machine**

PORT-A-COOL®'s operating costs are much lower than those of a central air conditioner. The initial equipment cost is also lower than air conditioners. Along with lower operating costs and simple installation, evaporative cooling can be a perfect, ozone-friendly alternative to traditional air conditioning.

It operates at a 10<sup>th</sup> of the cost of conventional air conditioning and is capable of cooling hundreds of square meters 7 degrees or more, saving PORT-A-COOL® customers hundreds, or even thousands euros per season!

Since PORT-A-COOL® is a state of the art, high efficiency, portable evaporative cooling system, its high efficiency cooling media coupled with a unique housing design, allows PORT-A-COOL® to cool effectively in very high relative humidity conditions. Since, as its name implies, it is portable, PORT-A-COOL® can be easily moved around shops, factories, back yards, sporting events and hundreds of other areas for maximum effectiveness, comfort and increased productivity.

PORT-A-COOL® uses a specially designed ridged cooling media, contained in a properly designed housing to insure effective direction of the air over the water saturated media at the proper air velocity.



## Applications

The PORT-A-COOL® has hundreds of applications, the area needs to be well ventilated, the more ventilation the better the PORT-A-COOL® will work. When there is no ventilation, there will be an increase of humidity, with ventilation there won't be an increase in humidity.

Some of the main applications of the PORT-A-COOL® are:

- **Automotive;** workshops, garages OSHA studies show that worker productivity improves with cooler working environments.
- **Aviation;** The stifling heat of summer can make aircraft maintenance unbearable, but PORT-A-COOL® units can reduce temperature by an average of 7 degrees.
- **Agriculture;** Utilize outside facilities during hot summer months without jeopardizing animal health. Increase milk production in cows by cooling holding pens and exit lanes.
- **Industrial;** Keep employees and equipment cool in workshops, warehouses, assembly and construction sites
- **Military;** Training areas, artillery range and other places where heat may limit usability. Cool tents through 16 inch unit vent systems or through existing openings.
- **Restaurant and dining;** The stifling heat of summer can make outdoor patio areas off limits, but PORT-A-COOL® units can reduce temperature by an average of 7 degrees. PORT-A-COOL®s are often used in preparation areas.
- **Sports;** Stay fit and be cool with PORT-A-COOL® units. Keeps workout areas cooler and circulates stale air. All units are mobile for easy spot cooling.
- **Tent and outdoor;** Keep cool during outdoor weddings, meetings or any event outdoors. PORT-A-COOL® is cooling also outdoor.






## Models

PORT-A-COOL® manufactures 4 different types of machines. The models are available in 16", 24", 36" and 48" diameter of the fanblades. All the machines are manufactured in the USA and are shipped completely assembled and ready to operate, right out of the box. All the models work on water and electricity, the integrated watertank let the machines work for hours without refilling. ¾" garden hose connection supplies water when needed.

PORT-A-COOL® is a durable one-piece molded plastic polyethylene housing. Except for the 16" model every machine is foreseen of wheels, thanks to the mobility the product can be used where the cooling is needed most. Except for the 48" machine all the models are in variable speed, the adapter can put on the adequate speed wanted.





|   | <b>Superficie</b> | <b>Dimensions</b>     | <b>Air delivery</b>            | <b>tank</b> |
|---|-------------------|-----------------------|--------------------------------|-------------|
|  | 75m <sup>2</sup>  | 0.78m x 0.95m x 0.56m | 5.580 m <sup>3</sup> per hour  | 11,5 liter  |
|  | 75m <sup>2</sup>  | 1.50m x 0.96m x 0.56m | 5.580 m <sup>3</sup> per hour  | 80,0 liter  |
|  | 167m <sup>2</sup> | 1.35m x 1.27m x 0.64m | 11.400 m <sup>3</sup> per hour | 53,0 liter  |
|  | 247m <sup>2</sup> | 1.70m x 1.57m x 0.81m | 17.160 m <sup>3</sup> per hour | 75,5 liter  |
|  | 325m <sup>2</sup> | 2.18m x 1.88m x 0.92m | 28.860 m <sup>3</sup> per hour | 94,6 liter  |

All the machines are environmental friendly, the air is ventilated and evaporated, there are no toxic gases.

### Pads

The Küül pads are manufactured of fluted cellulose sheets that are glued together. This material is chemically impregnated with special compounds to prevent rot and ensure a long service life. A special water distribution system spreads water over the surface of the pad, ensuring a uniform supply of water to keep the entire air contact surface thoroughly wetted.

Depending on the quality of maintenance and frequency of use, pads typically last up to five years.

### Accessories



The Port-A-Filler creates a totally portable 190 liter water supply for the PORT-A-COOL® units when a garden hose connection isn't available. It has a molded polyethylene plastic housing and moves easily on 4" solid rubber ball bearing casters.

It goes along with all PORT-A-COOL® models to supply a portable, remote water source. Ideal for outdoor tent weddings, outdoor picnics, stadium sidelines, golf ranges, warehouses, factories, concerts, gymnasiums, welding shops or hundreds of other uses.





**Cover**

Protect your PORT-A-COOL® during the time you're not using the unit. This plastic cover made to fit over the PORT-A-COOL®, provides maximum protection of the elements, dust and damage while being stored.



**Filter**

The new PORT-A-COOL® Filter Frames with Filters help keep contaminants and debris in the air of your facility from clogging the KÜÜL Cooling Pads for the 16", 24" 36" or 48" PORT-A-COOL®.

They're quick and easy to assemble and are made of strong PVC to form a frame approximately the size of the air intake area at the back of the PORT-A-COOL® unit



**16" Port-A-Cool® Cart**

Since the 16" model is the only model manufactured without casters, this durable and stable cart is designed to provide ease of movement and increase the height of the 16" Port-A-Cool®.



**16" Model Ducting Adapter**

This new one-piece adapter fits easily on the front of your 16" Port-A-Cool housing so that cool airflow can be ducted into a particular area. It's completely non-corrosive and simple to install onto the unit with four screws. The attachment offers many new cooling capabilities.



**Color PORT-A-COOL®**

The default color of all standard models is black. However, at your request, we will colorize any model to match your school or team colors, military or company logo.

Anything from *Dallas Cowboy Blue* to *United States Marine Corps Green*. Exact colors are matched from a sample you send to our factory.



### Consumption

#### Electricity cost

0,07€ per kw hour  
 0,8 kw/hr. PORT-A-COOL® usage  
 0,056€ PORT-A-COOL® kw cost / hr  
x 8 hours (assumed daily use)  
 0,448€ Daily Electricity Cost

#### Water cost

We assume the cost of water to be 6,70€ per 6.000 liter. The average use of a PORT-A-COOL® we put on 300 liters daily. (36" model).  
 0,0011€ per liter  
 37,5 liter water per hour  
x 8 hours (assumed daily use)  
 0,33€ Daily Water Cost

#### Total daily cost

Electricity cost and water cost per day costs **only 0,778€** per day (assumed use 8 hours a day). The smaller models will even have lower consumption and therefore lower costs!

### Soundlevel

The new High Performance (HP) models are well below acceptable standards for noise levels and the units introduce outside air, which has been proven to greatly improve indoor air quality.

A test has been performed by the California Environmental Protection Agency to research the noise level of the PORT-A-COOL® units.



#### Low speed

#### Médium speed

#### High speed

19.4

24.8

29.1

19.4

24.8

29.1

18.4

24.8

37.3

21.7

31.0

33.7

10.5

20.3

35.2

- All measurements in dB
- All measurements taken 1 meter from fan
- All measurements taken with pump on



## Legionella

Evaporative coolers have a continual replenishment of water to replace water that is evaporated through the air-cooling process. Under certain conditions, there is a low potential for microbial growth within such water systems. Whilst there is no requirement to chemically treat the water with biocides or other additives, there is a direction within maintenance procedures for coolers that are not used for extended periods to be drained and left dry to prevent potential microbial growth.

## Control measures

- *Renew water supply* – weekly changing the water in the tank
- *Regular inspection* – regular inspection should be undertaken of the cooling water supply and any recirculation system to ensure there is no visible evidence of algal or other contamination
- *Automatic draining of coolers* – the PORT-A-COOL® machine only supplies water when the pump is on.
- *Periodic chemical treatment of water* – Whilst chemical treatment of water within evaporative coolers is not a legislative requirement, most water treatment companies have slow release bactericides in tablet form. These can be placed in the cooler water basin. This is not recommended, as the water conditions in the coolers under normal operating conditions are not conducive to bacterial growth. Further, the use of biocides in water, which is to be evaporated directly into the workspace significantly elevates the risk of direct contamination of the air with chemicals.
- *Periodic testing of waters for bacterial presence*. Standard testing of the water by recognised laboratories can be undertaken, although it is unusual to see such testing applied to evaporative coolers. General bacteria tests together with specific testing for legionella can be undertaken, however, for the most part normal operating conditions do not promote bacterial growth. The only risk time is when the coolers are switched off for an extended period. If the proper procedure of emptying the water during these periods is carried out, there should not be any bacterial growth.

## Installation of the PORT-A-COOL® unit

### *Unpacking the PORT-A-COOL® unit*

The standard 24", 36" and 48" models are shipped completely assembled and sitting on a plastic pallet with a large cover box strapped over the PORT-A-COOL® unit. The 16" model PORT-A-COOL® units are shipped in an enclosed corrugated box and need only to be removed from the box.

### *Connecting the water and electricity*

Water can be provided by a watertank (16" model or extra tank) or via the traditional water connection. An European garden hose (exclusive with the PORT-A-COOL®) can be connected constantly to the water connection, water will not enter when the tank is full. Or the machines work several hours on the water inside of the tank.

All PORT-A-COOL®s are foreseen of 220volt.



#### *Placement of the PORT-A-COOL® unit*

#### *PORT-A-COOL® unit should be used in well-ventilated areas only.*

There are three primary considerations when deciding where to place the PORT-A-COOL® unit.

1. Fresh Air Supply – The inlet side of the PORT-A-COOL® unit (pad side) must be placed so as to insure that a smooth, uninterrupted supply of fresh air is available.
2. Air Pattern – The cool air discharged from (fan side) the PORT-A-COOL® unit should have a clear area in which to circulate, being as free of obstructions possible
3. Ventilation (Exhaust) – There should be a defined place in which the air from the PORT-A-COOL® unit can be exhausted from the area being cooled. This is to prevent the PORT-A-COOL® unit from recirculating air that has already been through the cooling process.

#### *Filling with water*

Once the sump tank is full, the float valve will shut off the supply flow. On the 16" filler cart model fill the 80 liter tank reservoir referring to the sight glass on the front of the reservoir for filling amounts. When turning on the pump, the supply of water flow will be restarted.

Once the sump tank is full, moving the pump switch on the 'ON' position will turn on the pump. The water will be wetting the cooling pads.

#### *Starting the fan*

Starting the fan is as simple as turning on the switch on the desired speed and level of cooling. It is preferred to step slowly to the maximum speed of the machine.

When turning off the fan, the pump should be turned off about 15 minutes before the fan, to allow the cooling pads to dry. This will increase the life of the pads.

### **Maintenance & storage**

#### *a. Daily maintenance*

Daily maintenance is really more an operational consideration than actual maintenance. On a daily basis, the pump should be turned off approximately 15 minutes before the fan is turned off.

#### *b. Weekly maintenance*

Once a week it is recommended to shut down the machine to drain the sump tank. Closing the Spray Bar Adjustment Valve and opening the Drain Valve accomplish this. A hose can be attached to the Drain Valve to direct the drained water to a remote disposal area. Once the Drain Valve is open, starting the pump will drain the unit. In a dusty environment the dirt and any remaining water may be vacuumed out using a wet/dry shop vacuum and wiped clean with a cloth.

#### *c. Storage*

Storage of the PORT-A-COOL® unit is very simple.

1. Drain all the water from the sump tank and clean as above, ensuring that the pads and sump are completely dry.





[www.lc-europe.com](http://www.lc-europe.com)

2. Roll up the electrical power cord and secure it to ensure that it will not be rolled over, tripped over or caught in equipment
3. Cover the PORT-A-COOL® unit completely to prevent dust build-up and store in a dry area.

### **Conclusion**

The principal of the PORT-A-COOL® is very easy, by evaporation of water the PORT-A-COOL® produces cool air. This evaporation leads to a decrease in temperature of between the 6 and 26 degrees.

### **The advantages of the PORT-A-COOL®**

The PORT-A-COOL® offers various advantages compared to the traditional air conditioning:

- the system works on places where an air conditioning cannot be used or is too expensive
- you can keep the doors and windows open
- the cooling system is environmental friendly and energy efficient. The energy consumption is ten times as low as the regular air conditioning.
- The PORT-A-COOL® is maintenance friendly and easy to clean
- Easy to use, the machines are mobile so can be put where you want to beat the heat



Life's Cool Europe, s.l.  
Diputació, 475, bjs. // 08013-Barcelona  
T-93 231 28 10 // Fax – 93 231 14 76