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Over the last 10 years I have been involved with a group of engineers and scientists in developing an alternative atmospheric water production technology coupled with a uniquely designed regenerative indirect/direct evaporative cooling (RIDEC). In 2012, we formed a company in order to introduce the product to the market, while we continue improving the technology.

We currently are interested in promoting our RIDEC systems, which have proved to be at least 30-40% more efficient than any existing analogues technologies, including the highly publicized products offered by Coolerado or StatiqCooling companies. Additionally, our RIDEC design is capable of producing lower temperatures and can function efficiently in a wider range of the climatic zones than the existing competitive technologies. In recent years, evaporative cooling method of air conditioning has become increasingly popular in many parts of the world. However, the performance of the evap. coolers, which currently exist on the market, suffers significantly in the higher humidity climates, where vapor compression technology is still predominately used. VV RIDEC can function efficiently in most of the Mediterranean countries, Arabian Peninsula, most of Australia and many other regions, including the Southwest of the United States

RIDEC system is simple in design and consists of inexpensive materials, assuring low construction cost of the product. When it is mass-produced, the cost of the manufacturing of our RIDEC systems and the potential distribution price is estimated to be below the competitor's.

SHORT DESCRIPTION OF EVAPORATIVE COOLING TECHNOLOGY

An evaporative cooler is a device that uses the thermodynamic process of water evaporation to cool the air. It's the process in which sensible heat is extracted from air and converted in latent heat without changing the enthalpy value.

There are three known types of evaporative cooling systems:

1. Direct Evaporative Cooling

It is a process of directly evaporating water in the main airstream and, therefore, adiabatically cooling the airflow. This process increases the moisture content of the air. The cooling potential of the process depends on the wet bulb depression and the wet-bulb temperature is the lowest theoretically achievable temperature of the process.

2. Indirect Evaporative Cooling

It is a 2-stage process of adiabatically cooling of an auxiliary airstream and simultaneously, sensibly cooling the main airstream without changing the moisture content. The cooling potential of the process depends on the wet bulb depression and the wet-bulb temperature is the lowest theoretically achievable temperature of the process.

A combination of Indirect/Direct Evaporative cooling (2 stage process) is commonly used to achieve the results closer to the wet-bulb temperature of the working air.

3. Dew Point Cooling or Regenerative Indirect/Direct Evaporative Cooling

There is a handful of companies that produce evaporative cooling systems that can lower the outlet air temperature below its wet-bulb temperature to the theoretical limits of dew-point temperature. Coolerado that uses M-cycle and StatiqCooling are the leading companies in this field. This technology uses more sophisticated heat-and-mass exchangers, in which a portion of the main airflow is diverted to be used as an auxiliary airflow. The cost of the production of this type of air-conditioning systems is higher than the traditional evaporative coolers, though the performance data from these companies displays only a marginal advantage.

In certain climates the difference between wet-bulb and dew-point temperatures of the ambient air could be over 20C. Therefore, the capability of lowering the working air temperature to the values close to its dew-point temperature is a significant advantage of this type of systems.

The Technical and Technological Advantages of Vitality Vector RIDEC System

1. Simplicity of construction (low production cost).
2. The design calls for a single source fan (low operating cost).
3. The unique high efficiency wetting system (no water pump is needed).
4. A larger portion of airflow is used as a primary airflow compared to other dew-point cooling machines.
5. The empirically collected data indicates much higher efficiency than that of any other similar product on the market. The outlet temperature of the working air falls within 10-15% of its dew-point values.
6. In certain climate zones, the system is capable of achieving temperatures close to 0C.
7. Heat recovery in winter.

2-STAGE EVAPORATIVE COOLERS PERFORMANCE DATA

	AZTEC* 2-STAGE, 1700 M3/H			VV RIDEC** 2-STAGE, 1700 M3/H		
AMBIENT CONDITIONS:						
ENT. AIR DB	40	35	27	40	35	27
ENT. AIR WB	18	18	18	18	18	18
DEW-POINT TEMP.	4.2	7.6	14	4.2	7.6	14
1st STAGE (INDIRECT)						
LVG. AIR DB	24.0	22.0	20.0	17.7	16.2	15.8
LVG. AIR WB	11.4	13.0	15.4	10.2	12.5	14.8
2nd STAGE (DIRECT)						
LVG. AIR DB	12.9	14.1	16.0	10.9	13.2	15.4
LVG. AIR WB	11.4	13.0	15.4	10.2	12.5	14.8
DEW-POINT EFF. (Ed)	0.45	0.48	0.54	0.63	0.69	0.86
ENERGY CONSUMPTION		0.8 kw/h			0.5 kw/h	

- DEW-POINT EFF. is a dew-point efficiency factor (Ed), derived as follows:
  Ed= (EAT-LAT)/(EAT-DPT).
- * Data for the Aztec model is based on published table.
- ** Data for VV RIDEC is based on bench testing.

Additional technical data and other information are available upon request.