

2006 HVAC Dehumidification Systems Product of the Year Award

2006

FROST & SULLIVAN

HVAC Dehumidification Systems
Product Innovation of the Year Award

AWARD DESCRIPTION

The Frost & Sullivan Award for Product Innovation of the Year is presented each year to the company that has demonstrated excellence in new products and technologies within its industry. The recipient company has shown innovation by launching a broad line of emerging products and technologies.

RESEARCH METHODOLOGY

To choose a recipient of this Award, the analyst team tracks all new product launches, R&D spending, products in development, and new product features and modifications. This is accomplished through interviews with the market participants and extensive secondary and technology research. All product launches and products in development in each company are compared and evaluated based on the degree of innovation and customer satisfaction. Companies are then ranked by number of product launches and products in development.

MEASUREMENT CRITERIA

In addition to the methodology described, there are specific criteria used to determine final competitor rankings in this industry. The recipient of this Award has excelled based on one or more of the following criteria:

- Significance of new product(s) in its industry
- Competitive advantage of new product(s) in its industry
- Product innovation in terms of unique or revolutionary technology
- Product acceptance in the market
- New product value-added services provided to customers
- Number of competitors with similar product(s)

The 2006 Frost & Sullivan Product Innovation of the Year Award is presented to Trane for its CDQ™ (Cool Dry Quiet) desiccant dehumidification HVAC system. With this new product line, Trane successfully recognizes a growing market requirement and delivers an innovation to the HVAC industry. The CDQ system exceeds the alternative products in energy and cost competitiveness and incorporates original features into its line of HVAC dehumidification systems.

Industry Requirements & the Significance of Trane's Product Development

The CDQ system, introduced in February 2005, was inspired by the need to provide the industry with high efficiency dehumidification capacity. Many existing products in the market are effective sensible temperature control devices that control humidity coincidentally; simply put, the compressor satisfies the thermostat on the wall, but it is not specifically designed for dehumidification purposes.

In many applications, as long as the humidity loads and sensible loads occurred together, this coincidental humidity control was acceptable, and, in applications where it was not, the industry resorted to using "cold coil" technology to satisfy humidity controls. In other words, what was commonly done to address humidity control for occupant comfort was to overcool the air (or dry it out) and then reheat it, which is an inefficient energy process adding extra cooling and heating energy costs.

Today, with growing mold and mildew awareness, end-users are looking to control humidity as they control

temperature. The CDQ system satisfies this market need by providing a more efficient method to control humidity, as compared to the overcool-then-reheat process. Through a lengthy energy analysis, the University of Illinois has determined that the co-efficient of performance for the CDQ is very high. The University of Illinois has labeled CDQ as the best dehumidifier in the market, and end-users are happily agreeing.

Revolutionary Technology

Eventually, Trane is expecting competition to introduce similar products when the current patents expire. Trane extends a lot of credit to Dr. Charles Cromer as the originator of this concept for which he filed and obtained several patents. Trane licensed the patented technology from Dr. Cromer and used that technology to develop the CDQ system. Trane then filed its own patent applications to the CDQ system, most of which are presently pending. However, Trane is not deterred by such prospects of its patent expiring due to its belief that stiffer competition only spurs the company's product development further with each of its innovations outracing the previous. Furthermore, once competitors introduce similar products, the market will add more legitimacy to its product design and increase awareness. Trane understands well that a company sustains itself in this industry by offering a quality product, competitively priced and backed by reputation. The patent design is not the only factor on which Trane bases its success.

Trane is the first company to develop a desiccant rotor utilizing a Type III desiccant, which can be regenerated at

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temperatures as low as 75 degrees Fahrenheit. The advantage this gives the Trane CDQ wheel is that it can use return air as the source of heat to reactivate the desiccant. Alternative solutions, such as gas-fired units, use new energy to heat a separate air stream to temperatures ranging from 140 degrees to 200 degrees Fahrenheit for the sole purpose of regenerating the wheel. As a result, Trane's CDQ product performs with 20.0-25.0 percent higher efficiency.

The CDQ system was designed to be more efficient than previous technologies by investing less energy to deliver the "cool and dry" air that most spaces need. Early on, Trane identified this as an area for improvement, licensed the basic technology and invested considerable research effort to optimize the product.

Product Value-added Services Provided to Customers

The CDQ was designed to reduce the complexity of this product; a simple design becomes a major advantage when dealing with dehumidifiers for comfort cooling applications. There can be a fair amount of complexity associated with the dehumidifiers currently on the market. These products typically include two or three fans, gas burners, and sensors. Trane's design eliminated many of these items, stripping the system down to the wheel and offering special sensors developed to measure the humidity with long-term stability.


TRANE®

Like the thermostat on the wall, the humidity sensor in conventional dehumidifiers can drift and jeopardize the efficiency of the system. Keeping this aspect in mind, Trane put extra effort in developing its control devices, believing it to be a key piece of the product. Trane has brilliantly succeeded in simplifying the controls for accuracy and stability.

A CDQ system also provides value-added services. The product has a long life expectancy, is engineered to last for many years, and includes long-term customer support services and parts available. This can be rare in this industry as companies come and go, only a very few number of companies can offer such an extensive and long-lasting post-sale service. Finally, the CDQ boasts of a competitive price, thus managing to deliver a high level of efficiency at an affordable price.

Product Acceptance & Penetration in the Market

Until recently, the dehumidifier market was not a focus area for Trane. However, with the introduction of the CDQ

system, the company is set to expand its reach into a new segment, differentiating itself from the competition. The CDQ is Trane's premier product in the North American commercial and industrial dehumidifier market, a market with revenues estimated at \$309.5 million in 2005 and expected to grow rapidly, spurred by the increasing concerns in indoor air quality.

Trane is focusing on select vertical markets for its product entry, the primary markets being healthcare and education. Another market that is attracting a lot of interest is the archive storage market. Other markets expected to show high demands for more efficient humidity controls are retail and grocery stores, as these end-users are more conscious about their utility bills. Trane has just introduced a light commercial unitary package, which is an adapter curb with a CDQ wheel that is mounted beneath a standard high-efficiency rooftop unit. The CDQ adapter curb enables the rooftop unit to provide dehumidification as and when required. This unit is expected to be a big seller in the market.

Trane is using its 1,500 sales engineers to serve the industry and is embarking on a major marketing effort to make end-users aware of what this new option can do.

Trane's strategy is to market through positioning advertisements for vertical market segments, educating end-users about controls in general, and conveying an environmental message. Considering that Trane offers a wide line of HVAC products, the company is focusing on providing its message on environmental comfort and good indoor air quality across its product line.

Growth as a Function of Innovation

Trane is experiencing rapid growth for its CDQ system in the comfort dehumidification market and is witnessing requests to expand to process dehumidification, light commercial, and residential applications. Trane has obtained support from the Department of Energy (DOE) and the Oakridge National Labs, which are endorsing Trane's new product innovation.

Trane's vision and understanding of the market has enabled it to bring forth a new product design that is less costly, more efficient, and simpler. Major innovations in the mature HVAC industry only arise few and far between, and this is considered by many in the industry as Trane's product of the decade. These cumulative factors make Trane the deserving recipient of the 2006 Frost & Sullivan Award for Product Innovation of the Year in the HVAC Dehumidification Systems Markets.