

MEEF

MIDDLE EAST

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Essential information for mechanical, electrical and plumbing professionals An ITP Business Publication | December 2009 Vol. 4 Issue 12

PUMPS
THE IMPORTANCE OF
DESIGN CRITERIA

**HVAC
FOCUS**
LATEST TRENDS,
TECHNOLOGY
MAIN
SUPPLIERS

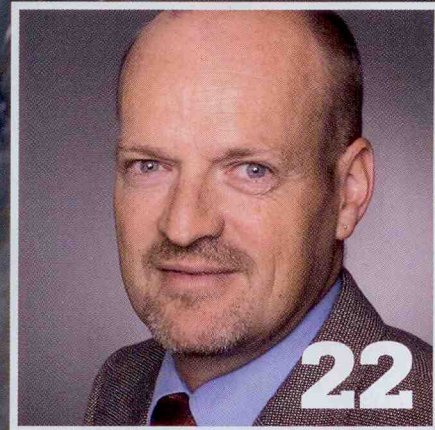
HUMMING ALONG

Rotary Humm's
flagship Novotel
Hotel project for
API in Al Barsha



ALSO: DSI'S CHARLES LEVER ON THE SUPPLY CHAIN

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Human-resource development in the construction industry.

ERV is a breath of FRESH AIR



Even though a proper ventilation strategy offers substantial savings, its role is less clearly defined than chillers, cooling towers and pumps. International Mechanical Engineering Corporation (IMEC) executive director **Aslan Al-Barazi** takes a closer look at the issue.

Global warming and the greenhouse effect may seem removed from our everyday lives. Being in the MEP HVAC business, however, we play a major part in this chain. About 60% to 70% of the total energy produced is attributed to HVAC. The actual carbon footprint (in kilograms) of this can be measured; the corollary is that the attendant savings when using environment-friendly ventilation products can also be calculated.

IMEC, in collaboration with Vent-Axia, conducted a year-long (January to December) study in this regard, based on a commercial

air-conditioned office with a balanced central ventilation system. The air flow was 0.555 m³/s and the mean room temperature was 23°C. The following figures were derived at:

ANNUAL LOSSES WITH NO ENERGY RECOVERY

Monthly kW/h: 16 300
Energy costs: AED5 379
Carbon dioxide generated: 16 952 kg

The fixed-volume ventilation system also suffers from over-ventilation when offices are partially occupied, with higher running costs and shorter filtration life cycles, which equates to increased maintenance costs. With the adoption of the Sentinel Totus demand energy recovery ventilation system

from Vent-Axia (90% energy recovered from used cooled indoor air being extracted to lower hot incoming air), there are significant reductions in the annual air-conditioning load and carbon dioxide generation:

ANNUAL SAVINGS WITH ENERGY RECOVERY

Recovered energy kW/h: 14 670
Energy cost saved: AED4 841
Carbon dioxide saving (kg): 15 257

PAYBACK ANALYSIS

Product costs

Supply and extract fan: AED8 175
Energy recovery ventilation unit: AED24 347
Variance: AED16 172

90%

Energy recovery achieved
by the Sentinel Totus system

It is imperative that government put stricter legislation in place that would require the industry to use environment-friendly solutions. Millions of tons of carbon emissions wasted in HVAC may thus be saved through tighter and more energy-efficient building regulations.”

Aslan Al-Barazi, executive director, International Mechanical Engineering Corporation (IMEC)

Savings

Reduction in air-conditioning cost: AED8 125

Recovered energy cost: AED4 841

Total reduction: AED12 966

These putative savings allow significant reductions to the installed air-conditioning plant capacity; reduced installation costs (six units as opposed to seven); and reduced operating costs. The demand ventilation strategy opted for optimises fresh-air ventilation for occupants (carbon dioxide control), ensuring excellent indoor air quality.

In addition, there is added potential for further significant running cost reductions when the offices are only partially occupied. Another interesting result of the above study was from the lifecycle cost analysis perspective. The study showed that payback would accordingly be in less than two years. Thus the system advantage applies to both environment as well as returns on investment.

It also has built-in carbon dioxide sensors, allowing the carbon dioxide level to be specified at the correct and healthy standard of no more than 1 500 parts per million. The carbon dioxide sensory system would then pace the levels of carbon dioxide in the air, regulating the fresh air as and when needed. This naturally increases the levels of alertness and consequential performance from both a workforce perspective as well as an academic/schools perspective, which is ultimately the most important investment any country can have.

The system's environmental settings also features acoustic linings for noise control, and can be operated via a building management system if need be. The Sentinel Totus system from Vent-Axia is the UK's first D-ERV (demand energy recovery ventilation) system to be

rated independently and tested to EN308. Vent-Axia's low-carbon ventilation range includes EC/DC motors, which not only reduce power consumption by up to 90%, but which can actually reduce their carbon footprint by 7 kg to 47 kg a year. The Sentinel D-ERV solution goes one step further by featuring in-built sensors for carbon dioxide, pressure (passive infrared occupancy detection), temperature and humidity. This system can sense when occupants enter a room, and adjust the air-flow accordingly to the number of occupants. The fans stop operating as soon as the occupants leave the room.

The Totus range incorporates both EC/DC motor, on-demand ventilation and heat recovery, and is able to extract up to 90% of the cooling load being wasted via discharge back to the outside atmosphere. It achieves this by means of a counter-flow heat exchanger that furthermore does not contaminate the intake flow with the flow being exhausted outside the building, as they are in separate flow circuits. Thus it is ideal for schools, hotels, theatres, offices and other environments with changing occupancy rates. [View](#)

For further detailed information on the IMEC/Vent-Axia cost-effectiveness study, contact Aslan Al-Barazi at imec@emirates.net.ae.



The Sentinel range

A GROWING MARKET

Energy recovery ventilation (ERV) systems, which provide exceptional energy efficiency and enhance indoor air quality (IAQ), are in demand in these environment-conscious times. Recent analysis from Frost & Sullivan of the North American ERV market cites earned revenues of US\$324.6 million in 2006, expected to reach US\$778.7 million in 2012. “ERV is a growing segment within the HVAC market, particularly in areas with warmer and high humidity climatic conditions,” said Frost & Sullivan research analyst Jorge Moreno.

The technology is being introduced to the Middle East by International Mechanical Engineering Corporation (IMEC), the official regional distributor for Vent-Axia of the UK. IMEC is showcasing Vent-Axia's Sentinel Totus ERV systems for such diverse applications as offices, hotels and schools.

“The focus on IAQ is another key trend benefiting ERV, as people become increasingly conscious of the importance to maintain air quality through properly designed and managed HVAC systems,” comments Moreno. Conditions such as sick building syndrome (SBS) are common due to structural changes in buildings that affect the quality of air circulating inside.

Energy waste constitutes another serious consequence. End users are not only aware of this issue, but also take an active interest in reducing building energy costs and greenhouse gas emissions, as well as adding building value in terms of savings and beneficial impact on occupants.

ERV systems present a potentially effective solution to both these issues because of their unique functioning that allows them to capture and recycle building energy to preheat, pre-cool, humidify or dehumidify the incoming air, instead of exhausting the energy to the outside.

The lack of knowledge on updated energy-saving practices and the potential to reduce operating costs is a restraint for this industry. Typically, facility managers and building owners rely on contractors to select the HVAC equipment for a building. Contractors, however, work within a budget and tend to purchase equipment based on price, rather than long-term efficiency and cost benefits, in the absence of immediate returns on investment.

The challenge lies in educating contractors about energy savings, IAQ and sustainability. Manufacturers must also convey the energy-saving message.