‘SICK BUILDING SYNDROME IS A HUGE PROBLEM IN THE UAE’

Leo Schuler, the Founder and CEO of Switzerland-based Pro Ace (Progressive Air Consulting and Engineering), in conversation with Fatima de la Cerna of *Climate Control Middle East* on adopting a holistic approach in building design for better IAQ

I understand that you specialise in indoor air quality (IAQ). Could you share details about the more recent projects you’ve worked on? What IAQ issues have been brought to your attention?

I have just completed a project in Abu Dhabi for a five-star hotel, whose kitchen exhaust was so bad that a number of its rooms could not be occupied. The hotel had been losing income for over a year, which is expected, because if you walked into a five-star hotel and found yourself escorted to a room that smelt like onions, you’d walk out, wouldn’t you? We had to treat the exhaust air and install air purifiers.

I also did work for an operator of an international airport, who had two main concerns: high energy consumption in the terminals and complaints about kerosene fuel smells from staff as well as passengers. It turned out the filter system being used at the time had very high pressure loss and was inefficient during high humidity conditions. What we did was replace the obsolete filter system with advanced chemical filters, resulting in improvements to the IAQ and a 30 % drop in energy costs.

What was causing the problem with the hotel’s kitchen exhaust?

It was primarily a design problem, and shortcuts were also taken during construction, with the building requirements not implemented properly. What happened was – and this is a case I’ve encountered in other projects – that the exhaust pipes were installed according to what was convenient for those who were on the job and not according to the needs of the building.

What I’ve seen quite often is that the exhaust air from a restaurant is not treated or neutralised and, once expelled, is deflected into a supply air duct rather quickly, because the exhaust stack and inlet are very close. It’s a recipe for disaster.

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You mentioned that it was primarily an issue with the design. In your opinion, how much of a challenge are flawed building designs in achieving good IAQ?

I’m an engineer, so I look at solutions. The design comes for me a little bit second. If you design a building to look good, but you forget about the services – the air supply, the lighting – you’ll end up unable to make the whole building work. It’s important to take a holistic approach. The building should not only look good but also fulfil its purpose of protecting its occupants and providing them with an invigorating environment.

Architects have to talk to us, the rest of the stakeholders, and make us understand what they’re after, so that from the start we can already plan

and find a way to make it work, because once the building is built, it will be too late.

Furthermore, IAQ is an important part of IEQ (indoor environmental quality) and is probably the biggest factor that contributes to sick building syndrome, but it is – unfortunately – often overlooked because air quality is intangible.

Just to give you an example: in the case of MERS (Middle East Respiratory Syndrome), if someone carrying the disease entered a building, the HVAC system can transmit that to other rooms, and we'll have an outbreak. That's why it's important that a building must be designed properly and the right measures must be taken to ensure that a healthy environment can be maintained.

Based on your observation, how big a problem is sick building syndrome in the UAE?

Sick building syndrome is a huge problem here in the UAE. Most of the buildings we go to have issues, and I think it's partly because cost is still the focus and priority. Essential services like HVAC systems are also seen as a burden, a necessity because it's too hot, but many don't see the benefit of going beyond the minimum. Thus, I think that when people here talk about the costs of a building, they should also ask themselves how much the sick building syndrome will cost them and how much financial loss they'll suffer if people take sick days. How does an unhealthy and unproductive workforce affect a company's bottom line?

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Chemical filters are widely used in Europe and in the US. They are an established technology, and they've been around for 30 years, but they are perhaps seen as a luxury here. Most engineers in the UAE use mechanical filters to take care of dust and particles, but chemical filters are highly effective against VOCs and other pollutants. They're a very good complement to HVAC systems. Upfront, they are more expensive, but they offer savings in energy and running costs.

Some experts claim that it is difficult to achieve energy savings while maintaining a healthy IEQ, but you are talking about enjoying both. In your opinion, what can the GCC region's industry players do to make sure end-users enjoy both benefits?

They need to start with the building hull. They need to have it properly shaded and insulated to minimise the thermal load from the harsh sun, thereby minimising the cooling load. If they build a glass palace with a glass facade, the thermal load from the sun will be higher. That's a design choice, of course, but it would be more sensible to have a design that's suitable to the climate.

Players must also analyse what kind of pollutants are threats to the environment to determine what HVAC solutions are necessary; and to find a balance between using outdoor air and recirculating conditioned air. By achieving a high recirculation rate of indoor air, they won't have to cool as much outdoor air, which will mean lower cooling and dehumidification costs.

The key, really, is for all stakeholders to work together from the start. An engineer does not speak the language of an architect, and vice versa. Everyone has to understand each other, because proper foresight and planning would mean better results for the building owner and occupants. ccme