

PREVENTING SICK BUILDING SYNDROME WITH YOUR HVAC SYSTEM

BY PETA JARDINE

WHITE PAPER

PROBLEM

Some companies will supply Electric Duct Heaters (EDH's) with a mild steel painted surface finish which continuously bakes or burns over a period of time, releasing fumes into the duct. These fumes are known to cause Sick Building Syndrome (SBS) which affects all individuals within the building and can result in unwanted illness and possible liability. SBS is often caused by a HVAC (Heating, Ventilation & Cooling) system that is re-circulating polluted air.

SICK BUILDING SYNDROME

The United States Environmental Protection Agency (EPA) explains that SBS describes 'situations in which building occupants experience acute health and comfort effects that appear to be linked to time spent in a building, but no specific illness or cause can be identified.'¹ On a similar note, the term 'Building Related Illness' (BRI) is used when symptoms of diagnosable illness are identified and can be attributed directly to airborne building contaminants.

The EPA also goes on to explain that one of the identified causes of SBS is biological contaminants or microbes. These contaminants can be found breeding in stagnant water that collects in ducts and HVAC systems, as well as other contaminants that may build up on equipment within the ducts, such as rust or chemical surfaces that are blown throughout the HVAC system.

Suggested precautions for preventing SBS in buildings include regular maintenance of the HVAC system to ensure pollutants are not spread throughout the building.

A World Health Organisation report into SBS suggested that up to 30% of buildings built or remodelled in 1984 worldwide may be linked to symptoms of SBS.

It has also been suggested that inadequate ventilation and heating can be contributing factors.



SOLUTION

By using EDH's with Stainless Steel finned air heater elements, the risk of polluting contaminants being blown throughout the HVAC system is greatly reduced.

As an extra precaution against both fire and the diffusion of smoke and polluted air, Australian Standards specify that there must be a minimum of two safety devices on electric duct heaters. This can be achieved using a variety of instruments including over-temperature thermostats, air pressure switches and/or high temperature kaoboard or millboard insulation. Insulation can be supplied on the underside of the terminal box and a minimum of 300mm upstream and downstream from the heaters if a duct section is being provided.

Duct heaters should also be supplied with a balanced load across all phases and effectively staged to ensure an even heat dissipation is distributed evenly across the duct face area. All EDH's can be pre-wired using high temperature rated silicone insulated cabling to high temperature terminal blocks with stand offs.

At Thermal Electric Elements our quotes for electric duct heaters include the following as standard product, unless specified:

- Stainless Steel finned elements
- 120°C manual reset over temperature thermostat
- Fire proof insulation on the flanged terminal enclosures to meet Australian Standards
- High temperature silicone wiring to Bakelite terminal blocks if required
- Element supports for elements over 600mm in reach
- Minimum duct face coverage of 70%

Optional extras include:

- Adjustable air pressure switches
- Weatherproof terminal boxes
- Isolation switches and contactors per stage
- Auto reset thermostat
- 60-150°C adjustable manual reset over-temperature thermostats

Thermal Electric Elements can also manufacture complete duct sections, complete with fire proof insulation and 35mm TDF flanges; spigots; or slide connections.

All units manufactured by Thermal Electric Elements comply with Australian Standards AS3102 under certification no: 5162

REFERENCES

1. US Environmental Protection Agency - Indoor Air Quality (IAQ) - Indoor Air Facts No. 4 (revised) Sick Building Syndrome - 1991
<http://www.epa.gov/iaq/pubs/sbs.htm>

