



THE 'SICK BUILDING SYNDROME' – what is it?

A term coined by the World Health Organization identifying a condition which incorporates symptoms of a psychosomatic and physical nature that appear in connection with artificial room environments, which have a genuine sickness value, and lead to lasting suffering in the people concerned.

Numerous studies conducted by the Environmental Protection Agency (EPA) over the last 25 years have shown measurably increased levels of more than 107 known carcinogens (cancer causing elements) in modern offices and homes. The presence of these VOC's (volatile organic compounds) is due to the switch from open windows to energy efficient living and working environments in the 1970's. Combined with the advent of modern building methodology and products, the result has been energy efficient homes and offices that contain amounts of known cancer causing pollutants. In extreme cases, some buildings have such high levels of contaminants that they are known as "Sick Buildings" because exposure to them results in multiple symptoms of sickness exhibited by their inhabitants.

Where does this Syndrome come from?

The EPA estimates that indoor air is two to five times as polluted as air on the other side of the window. What's more, we spend between 70 - 90% of our time indoors (at home, in the workplace or even in your fitness centre) so the risks to health may actually be greater from the pollution in our homes and offices, than from outside on the heavily polluted streets.

The causes of indoor air pollution are many. Not only does the polluted outdoor air find its way into our homes, and sometimes concentrate there, but we add to it with tobacco smoke, gas stoves (especially if they are not vented, as they often are in Hong Kong), pressed wood, dust mites and cockroach antigen, moulds and mildew, animal dander and saliva, and fumes from carpet adhesives and upholstery. Poorly designed, maintained or operated air-conditioning and mechanical ventilation systems worsen the problem, and high temperatures and humidity can increase concentrations. As well, uses of the building that were unplanned when the building was designed or renovated, together with the building materials and furnishings, can be a factor.

This atmosphere also means the mixture of atmospheric gases, or gas admixtures and non-physiological concentrations which include Carbon Monoxide (CO) (an asphyxiant which suffocates you), Carbon Dioxide (CO₂), Nitrogen Dioxide (NO₂) ozone, sulphur dioxide, nitrous gases, aliphatic and aromatic and halogenated hydrocarbons of all kinds. The majority of these gases are created by the combustion of fossil fuels and in industrial processes. When present in big cities they enter the air conditioning systems, are re-distributed and even enriched still further. In every case, since these are toxic to the nervous and immune systems, a multiple sensitivity appears with complex symptoms that generally go unrecognised/undiagnosed by the vast majority of doctors. For the most part people are ignorantly dismissed as malingerers, but in reality they are very sick! ***How do you feel?***

What are the Health Effects of Indoor Air Pollution Components?

Pollutant	Health Effects	Sources	Other Causes
Respirable Suspended Particulates (RSP)	<ul style="list-style-type: none"> • Visibility impairment • Breathing and respiratory symptoms such as shortness of breath, coughing and wheezing, aggravation of existing respiratory diseases and damage to lung tissues • Individuals with chronic lung and heart disease, influenza, asthma, elderly people and children are more susceptible • WHO indicate that even low levels are harmful and are linked to higher death and morbidity rates. • 	<ul style="list-style-type: none"> • Diesel & petrol cars • Commercial Vehicles • Buses • Motorcycles 	<ul style="list-style-type: none"> • Power stations • Marine vessels • Fuel combustion • Cement plants • Incinerators • Aircraft • Soil blow-off • Trans-boundary air pollution
Nitrogen Dioxide (NO ₂)	<ul style="list-style-type: none"> • Visibility impairment • Aids photochemical smog formation • Irritation of lungs and lowering resistance to respiratory infection such as influenza • Individuals with respiratory problems, such as asthma, are more susceptible. May also impair lung development in young children <p>Concentrations of nitrogen dioxide indoors can be five times the level found outdoors. See additional notes below regarding tobacco smoke.</p>	<ul style="list-style-type: none"> • Diesel & petrol cars • Commercial Vehicles • Buses • Motorcycles • Tobacco smoke 	<ul style="list-style-type: none"> • Power stations • Marine vessels • Fuel combustion • Aircraft • Cement plants • Incinerators • Trans-boundary air pollution • Poorly vented/maintained gas appliances • Welding
Carbon Monoxide (CO)	<ul style="list-style-type: none"> • Visual impairment • Reduced work capacity • Reduced mental function and poor learning ability • Persons suffering from heart and circulatory problem, foetuses, young infants, pregnant women and elderly people are likely to be more susceptible • Impedes co-ordination • Worsens cardiovascular conditions • Produces fatigue, headache, confusion, nausea and dizziness 	<ul style="list-style-type: none"> • Diesel & petrol cars • Commercial Vehicles • Buses • Motorcycles • Tobacco smoke • Charcoal BBQs 	<ul style="list-style-type: none"> • Power stations • Marine vessels • Aircraft • Industry
Carbon Dioxide (CO ₂)	<ul style="list-style-type: none"> • low productivity and employee error • workplace aggression/irritability • drowsiness/lethargy/headaches and fatigue 	<ul style="list-style-type: none"> • Human emissions 	<ul style="list-style-type: none"> • Poor ventilation • Combustion • Metabolic activity • Power Stations

Formaldehyde (HCHO) (Volatile Organic Compound)	<ul style="list-style-type: none"> • Headaches • Dizziness • Lethargy • Rashes/allergies • Nausea • Irritation to eyes, nose, throat and upper respiratory tract. 	<ul style="list-style-type: none"> • Tobacco smoke • Carpeting • Furniture • Foam Insulation • Upholstery/ drapery fabrics • Many common household products 	<ul style="list-style-type: none"> • Formaldehyde gas is found in around 3,000 building products.
Radon (Rn) Radioactive Gas	<ul style="list-style-type: none"> • Carcinogenic 	<ul style="list-style-type: none"> • Concrete 	<ul style="list-style-type: none"> • Minerals in the ground – granite
Microbes and Fungi	<ul style="list-style-type: none"> • A number of lung conditions due to infection or allergic reaction to these pollutants • Legionnaire's disease • Humidifier lung 	<ul style="list-style-type: none"> • Viruses • Bacteria • Airborne fungus spores • Dust mites 	<ul style="list-style-type: none"> • Poorly ventilated buildings • Improperly maintained air ducts, air-conditioners, humidifiers, air-cleaning filters, run-off water, refrigerators and contaminated water appliances.
<p>1. Tobacco Smoke is a mixture of gases, liquids and particles. There are hundreds of chemical compounds in tobacco and hundreds more are created when it burns - around 4,000 have been identified including those which are toxic, carcinogenic, or both. Some of the most hazardous are tar, nicotine, carbon monoxide, cadmium, nitrogen dioxide, formaldehyde.</p> <p>2. Up to 800 different toxic vapours are emitted by synthetic surfaces, furnishings, photocopiers and laser printers, and as well the use of personal care products, pesticides, paints and solvents all contribute to indoor air pollution.</p>			

To summarise, many of the well-documented 'common ailments' being suffered by people can clearly be attributed to poor quality air, and the '*Sick Building Syndrome*': such as:

Headaches
 Eye, nose and throat irritations
 Reduced powers of concentration
 Aggressive behaviour/irritability
 Fatigue/lethargy
 Chronic cough (particularly in children)

Dizziness and nausea
 Drowsiness
 Allergies/dry itchy skin
 Sinus congestion
 Respiratory problems (shortness of breath/wheezing)
 Worsened Asthmatic/cardiovascular conditions

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