

Mr Frank Fenton
SUSTAIN

SICK BUILDING SYNDROME

Dr Jagjit Singh
BSc MSc PhD CBIol MIBiol FIRTS FRSH FRSA
Director
Environmental Building Solutions Ltd.
Galley Cottage, Galley Lane,
Great Brickhill, Milton Keynes,
Buckinghamshire, MK17 9AA

Tele:01525 261922
Fax: 01525 261923
Ebs@ebssurvey.co.uk www.ebssurvey.co.uk

SICK BUILDING SYNDROME

The world health organisation (WHO) defines health as a state of complete physical, mental and social well being, it is not merely the absence of disease and infirmity. The term Sick Building Syndrome (SBS) is frequently used to describe a set of symptoms often reported by occupants of certain buildings. The other terms used are Tight Building Syndrome and Stuffy Office Syndrome. The symptoms are supposed to be direct or indirect consequences of the following factors:

- Design and construction factors
- Environmental factors
- Perceptual and psychological factors
- cultural and organisational factors(1, 2, 3 & 4).

A majority of the occupants in these buildings complain, and most frequent complaint is irritation of eyes, nose, and throat. Many different factors are known to be potential agents for the symptoms and no definitive causality has been identified yet. Volatile organic compounds (VOC) are known to have a potency to cause symptoms like those included in SBS. A dose-response relation for sensory reactions and mucosal irritation caused by volatile organic air pollutants is at 3 mg/m³(about 0.9 PPM toluene equivalent) for the total volatile organic compounds (TVOC) is suggested for the nonindustrial indoor climates (5).

Five categories of symptoms exemplified by some complaints reported by occupants supposed to suffer from sick building syndrome (5).

- Sensory irritation in eyes, nose, and throat
Examples: pain, sensation of dryness, smarting feeling, stinging irritation, hoarseness voice problems
- Neurogenic or general health symptoms
Examples: headache, sluggishness, mental fatigue, reduced memory, reduced capability to concentrate, dizziness, intoxication, nausea and vomiting, tiredness
- Skin irritation
Examples: pain, reddening, smarting or itching sensations, dry skin
- Unspecific hypersensitivity reactions
Examples: running nose and eyes, asthma-like symptoms among non-asthmatics, sounds from the respiratory systems.
- Odour and taste symptoms
Examples: changed sensitivity of olfactory or gustatory sense, unpleasant olfactory or gustatory perceptions.

The five categories of symptoms shown above cover the major complaints. Irritation of mucousal membranes in eyes, nose, and throat are among the most frequent symptoms. Other symptoms, e.g. from lower airways or from internal organs, should be infrequent.

A large majority of occupants report symptoms. The symptoms appear especially frequent in one building or in part of it. No evident causality can be identified, in relation either to exposure or to occupant sensitivity(5 & 6). The WHO-group stated that more than 30% of all new buildings seem to be affected by SBS.

The observations summarised here are based on investigations, which have major limitations. They do, however, indicate that the SBS, if it exists, is dominated by irritative symptoms in eyes, nose, and throat and by headaches. The syndrome may include other effects related, for example, to productivity and performance, but such effects have not yet been positively identified.

Tentative Dose-Response Relation for Discomfort Resulting from Exposure to Solvent-like Volatile Organic Compounds.

TOTAL CONCENTRATION	IRRITATION AND DISCOMFORT	Exposure range
< 0.16	No irritation or Discomfort	Comfort Range
0.16-3	Irritation and Discomfort possible if Other exposures interact	The SBS Range
3-25	Exposure effect and Probable discomfort Or headache possible if Other exposures Interact	The Discomfort range
>25	Additional Neurotoxic effects other than Headache may occur	The Toxic range

Environmental testing of air samples should be carried out for a variety of chemicals, (Co, Co2, Formaldehyde, and VOC's) particulates, (respirable and non-respirable airborne particles) and microbial contaminants (fungi, bacteria and house dust mites). Outbreaks of allergic diseases such as allergic rhinitis, asthma, and hypersensitivity pneumonitis may also be an indication for microbial contaminants. Identifying a single causative agent is virtually impossible because many of these factors are highly interrelated with one another. For example, newer buildings are more likely to be closed, mechanically ventilated structures with high levels of centrally controlled fluorescent lighting and modern furnishing that may emit moderate levels of VOCs.

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