06

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Wool Interiors

Wool: An Answer to VOCs

As we spent increasing amounts of time indoors[1], we increase our exposure to VOCs. Volatile organic compounds, or VOCs, are substances formed from a combination of chemical elements which easily become vapours or gases. VOCs are released from many products found in our homes – not only solvents, paints and thinners but also

- Cleaners and disinfectants
- Air fresheners
- Copy machines and printers
- Building materials and furnishings[2]

Familiar VOCs include benzene, formaldehyde, and toluene.

Concentrations of some air pollutants may be two- to five-fold higher indoors than outdoors. Improvements in thermal insulation, in order to reduce heat loss, and scarce ventilation in modern dwellings, have also led to a deterioration of indoor air quality.[3]

The result can be what is known as sick building syndrome (SBS) – feelings of ill health that seem to be linked directly to the time spent in that building.

Studies have shown that common VOCs, which are implicated as a cause of SBS, can be absorbed and chemically bound by wool, improving ambient air quality.

When used as furniture, carpets, clothing, or insulation, wool can be a sustainable and natural solution to the problem of accumulating indoor contaminants.[4]

Wool can absorb a range of harmful chemicals which occur in the indoor environment

Wool – Protection in the Home

Gas, smoke, and toxic fumes are the most common cause of death following domestic fires. Fatalities are more likely to occur in rooms where soft furnishings are found, making it vital to choose the least flammable materials.

Research indicates that wool used in apparel and furnishing textiles can provide a greater level of fire safety than other fibres[5]:

- Wool is the most flame resistant of fibres commonly used in interiors (cotton, rayon, polyester, acrylic and nylon)
- Due to its high Limiting Oxygen Index (LOI), the amount of oxygen needed to sustain combustion, it is harder to ignite wool than other fibres
- Wool does not melt, unlike polyester and nylon, which melt at 252-292˚C and 160-260˚C respectively
- Wool – even when warm – does not stick to the skin
- Wool has a low heat combustion level, meaning the amount of heat released in burning

Safely Furnished Interiors

Wool is the logical choice for creating a safe and healthy indoor environment[5].

VOC absorption, combined with flame resistant chemical structure, makes wool the safety fibre of choice for interior design

- Wool carpets have exceptionally low levels of flammability.
- When wool does burn it forms an insulating char. It also produces less smoke and fewer fumes than synthetic alternatives.
- Wool can also slow down combustion and flame spread in bed linens and furnishings, even when other fibres are also involved.
- Fire spreads slowly in a wool blanket or duvet, with low heat output and relatively little smoke, even over a longer period.

About IWTO

With a world-wide membership encompassing the wool pipeline from sheep to shop, the International Wool Textile Organisation represents the interests of the global wool trade. By facilitating research and development and maintaining textile industry standards, IWTO ensures a sustainable future for wool. To learn more about IWTO and its activities, visit www.iwto.org.

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[1]A 2001 survey funded by the U.S. Environmental Protection Agency found that respondents spent 87% of their time in enclosed buildings and 7% in enclosed vehicles. The National Human Activity Pattern Survey (NHAPS): A Resource for Assessing Exposure to Environmental Pollutants, by Neil E. Klepeis et al. (Lawrence Berkeley National Laboratory, 2001) https://indoor.lbl.gov/sites/all/files/lbnl-47713.pdf (retrieved 26 Nov 2018)

[2]Volatile Organic Compounds: https://toxtown.nlm.nih.gov/chemicals-and-contaminants/volatile-organic-compuounds-vocs (retrieved 26 Nov 2018)

[3]Respiratory health and indoor air pollutants based on quantitative exposure assessments Marion Hulin, Marzia Simoni,et al. European Respiratory Journal 2012 40: 1033-1045; DOI: 10.1183/09031936.00159011. http://erj.ersjournals.com/content/40/4/1033 (retrieved 26 Nov 2018)

[4]Absorption of volatile organic compounds by different wool types. Mansour, Elie & Curling, Simon & Stéphan, Antoine & Ormondroyd, Graham. (2016). Absorption of Volatile Organic Compounds by Different Wool Types. Green Materials. 4. 10.1680/jgrma.15.00031. https://www.researchgate.net/publication/295079483_Absorption_of_Volatile_Organic_Compounds_by_Different_Wool_Types (retrieved 26 Nov 2018)

[5]Flammability Report, New Zealand Merino Company Limited, http://www.eco-terric.com/flammability-report.pdf (retrieved 26 Nov 2018)