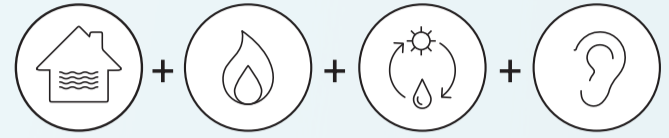




# KEY TECHNICAL ATTRIBUTES AND BENEFITS OF BRINGING WOOL INTO YOUR HOME



## INDOOR AIR QUALITY

Considering humans spend the majority (~90%) of their lives inside (CPSC, 2008), indoor air pollution is arguably of much greater importance to human health than outdoor air pollution. The effects of indoor air pollution can include irritation of the eyes, nose and throat, respiratory illness, headaches, dizziness and fatigue (EPA 2008).

Indoor air pollution occurs when harmful gases and/or particles are present in the air of a building. When air exchange is inadequate, these contaminants can build up to potentially harmful levels.

Three common gaseous indoor air pollutants with known adverse health effects on humans are nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and formaldehyde (HCHO) – all of which are effectively removed by wool textiles.

## ACOUSTIC PERFORMANCE

Acoustics are the physical properties of sound which affect us all in everyday life. Textiles that demonstrate poor acoustic performance can have a negative impact on human health.

Sound absorption is important in both commercial and residential applications. Wool textiles have been used to significantly improve the acoustic performance of rooms as it acts as a sound absorber and dampens any impact noise.

### Key Points:

- The fibrous nature of wool interior textiles means that, unlike many other materials, wool products can reduce, at the same time;
  - airborne sound
  - surface noise
  - sound transmission

## FLAMMABILITY PERFORMANCE

Wool fiber is naturally flame resistant, and the performance of wool exceeds that of all other commonly encountered textile fibers. This flame retardancy arises from wool's unique chemical structure (for example, its high nitrogen (14%) and water content, which display the following beneficial properties and behaviours:

- A very high ignition temperature (570-600°C)
- A high Limiting Oxygen Index (20-25%) –LOI is a measure of the minimum % of oxygen required to sustain combustion
- A low heat of combustion
- A low rate of heat release
- Self extinguishing

## HOW DOES WOOL COMPARE TO OTHER FIBERS?

Fiber	Ignition Index (0-40)	Flame spread index (0-20)	Heat evolved index (0-20)	Smoke evolved index (0-20)	Overall flammability index (0-100)
Wool	26	0	0	10	36
Polypropylene	28	12	14	14	68
Nylon	30	14	16	16	76
Acrylic	28	16	20	14	78

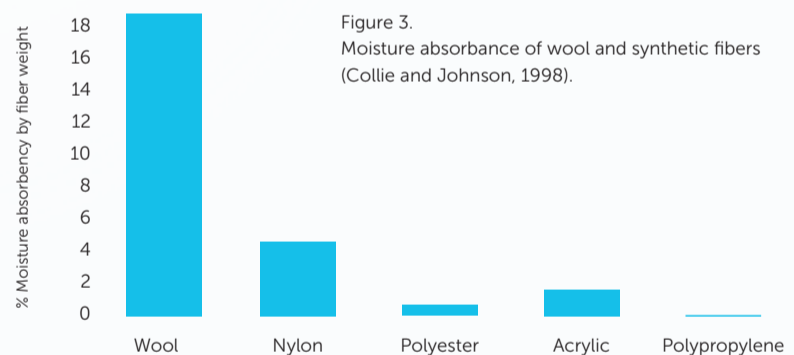
Table 1. key measures of flammability for common textile fibers.

## HEAT AND MOISTURE MANAGEMENT

How well heat and moisture are managed within a dwelling is an important determinant of overall comfort and occupant health - use of wool textiles can have significant benefits with respect to both. Heat loss from an uninsulated house occurs through a number of pathways, the majority being walls and ceiling. Wool thermal insulation is the perfect solution to insulate a house against heat loss while also having the intrinsic ability to buffer moisture.



The most efficient means of increasing thermal resistance of a given structure is to increase the amount of air trapped. The natural crimp of wool fibers assists with this process. The same air entrapment also inhibits loss by convection (movement of heat in air caused by the tendency for hot air to rise) and radiation (emission of heat to air directly from a source). Wool is also able to actively absorb moisture from the indoor environment – these inherent properties far exceed those of synthetic fibers.



In a practical sense, this means that wool textiles are always seeking to maintain equilibrium with the environment around them – so that as the air above them becomes more saturated with moisture, there will be a tendency for the textile to absorb this moisture, thus buffering the environmental change.

### Key Points:

- Wool fiber has a hydrophobic (water repelling) exterior and hydrophilic (water loving) interior, creating its unique moisture management properties – properties that are not shared by synthetic fibers
- In contrast to most synthetic fibers, wool has the capacity to remove large amounts (up to 35% of its own weight) of moisture from inside a room, before the fiber even begins to feel wet
- Wool's chemical structure means that it has the ability to actively absorb and desorb moisture and to gain and release heat depending on the external and internal environment - buffering a room against environmental changes
- A wool textile's ability to absorb moisture may result in a reduced propensity for condensation within an interior space
- Significant energy savings and comfort/health improvements are achievable by installation of wool interior textiles

### WHAT THIS MEANS:

Wool insulation is a healthy and comfortable choice for an insulation system. It provides moisture management, passive filtration and acoustic buffering. On its own wool exceeds most other mediums in each category; on a whole there is no comparison for a high-performance, natural, healthy choice for insulation in your live/work space.