British Wool fact sheets

Wool & Fire

Naturally flame-resistant

Wool is a highly trusted natural fibre for use in public areas such as hotels, aircrafts, theatres and cruiseships as well as for protective clothing for fire fighters and military soldiers. Of all the commonly used textile fibres (cotton, rayon, polyester, acrylic and nylon), wool is widely recognised as the most flame resistant.

Flammability of common textile fibres

Fibre	Limiting Oxygen Index (%)	Heat of combustion (Kcal/g)	Ignition Temp (°C)	Melting Temp (°C)
Wool	25.2	4.9	570-600	Does not melt
Cotton	18.4	3.9	255	Does not melt
Nylon	20.1	7.9	485-575	160-260
Polyester	20.6	5.7	485-560	252-292
Rayon	19.7	3.9	420	Does not melt

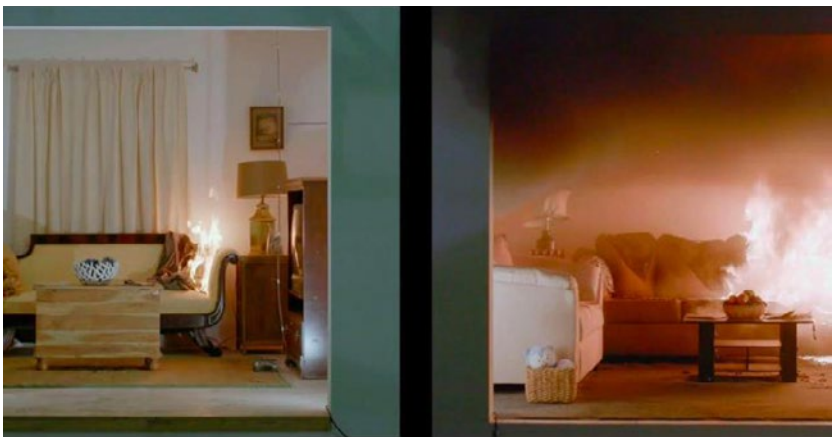
Source: CSIRO

Wool's inherent fire resistance comes from its naturally high nitrogen and water content. Because of this, wool requires higher levels of oxygen in the surrounding environment in order to burn. Wool may be ignited if subjected to a significantly powerful heat source, but it does not support the flame. If smouldering occurs, it usually continues only for a short time. In addition, wool's highly cross-linked cell membrane structure will swell when heated to the point of combustion, forming an insulating layer that prevents the spread of the flames.

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. Choosing carpets, bedding, curtains and soft furnishings made out of wool significantly increases the safety of your home.

Natural | Synthetic



Source: Fire Safety Research Institute (FSRI), Fsri.org

In 2020, FSRI captured a side-by-side burn comparison of natural vs. synthetic furnished rooms. This image shows how fast fire and smoke can spread in 4 minutes or less.

Wearing wool in high risk situations

Soldiers, police and firefighters have been relying on wool for many centuries due to the fibre's natural protective properties. Today, those who work in high risk environments– such as astronauts, search and rescue teams, even Formula 1 drivers– benefit from wearing wool, reducing the risks associated with the danger of being exposed to flames.

Wool & Fire facts

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

- Wool is difficult to ignite (570-600°C) compared to cotton (255°C) or polyester (485-560°C)
- 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
- Wool does not produce toxic fumes when exposed to high temperatures