

# PROVIDES PROTECTION

## THE PROBLEM



The fire performance of carpets is extremely important for the safety of the entire building envelope. The key safety criteria for an interior textile is its ignitability, the rate of flame spread once ignited and its smoke emission.

## WHY DOES WOOL OUTPERFORM OTHER FIBERS?



Wool carpet is naturally flame resistant and outperforms all other common carpet textile fibers. The flame retardancy of wool is due to wool's unique chemical structure, and high nitrogen and water contents. This means wool carpet has the following benefits:

- It takes a very high temperature to ignite
- A low rate of heat release
- Doesn't melt or stick upon burning
- It is self extinguishing
- It forms an insulating char when it burns
- Evolution of less smoke and toxic gases formed during combustion compared to most man-made fibers.

## THE RESEARCH

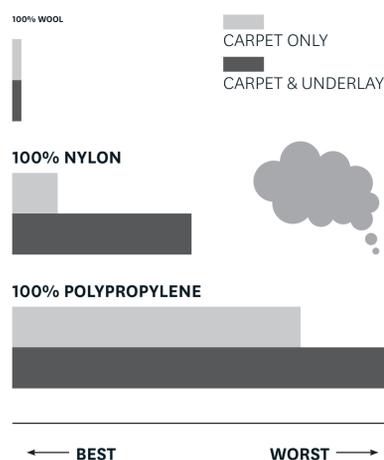
When the flame performance of wool carpets are compared to carpets made from man-made fibers, wool demonstrates a higher Limiting Oxygen Index (LOI), higher ignition temperature and lower melting temperature.

Wool carpets also require more energy to ignite and they demonstrate a lower smoke emission compared to man-made carpets.

KEY MEASURES OF FLAMMABILITY FOR COMMON TEXTILE FIBERS

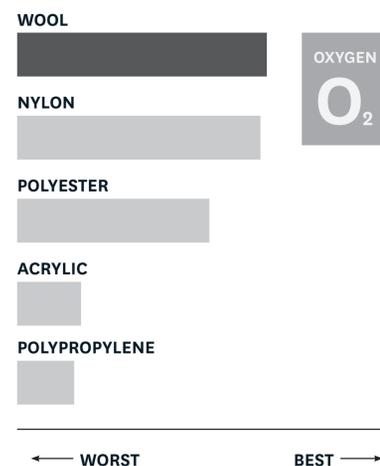
Fiber	Limiting Oxygen Index (%)	Heat of combustion (Kcal/g)	Ignition temperature (°C)	Melting temperature (°C)
Wool	25.2	4.9	570-600	Does not melt
Cotton	18.4	3.9	255	Does not melt
Nylon	20.1	7.9	485-575	160-260
Polyester	20.6	5.7	485-560	252-292
Rayon	19.7	3.9	420	Does not melt

NBS FLOORING RADIANT PANEL TESTS RESULTS FOR TOTAL SMOKE EMISSION



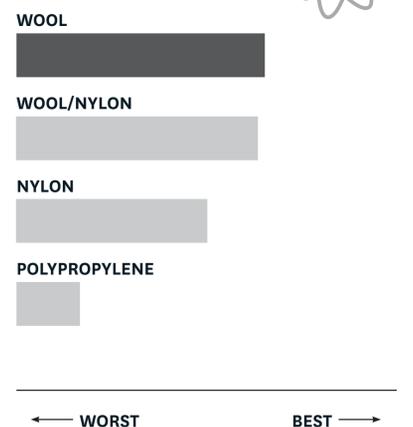
- When combustion occurs, wool fiber carpets emit less smoke compared to man-made fiber carpets.

LIMITING OXYGEN INDEX (LOI) OF COMMON TEXTILE FIBERS



- Wool textile fibers require more oxygen to support combustion compared to man-made textile fibers.

ENERGY REQUIRED TO IGNITE CARPETS



- Wool fiber carpets require more energy to ignite compared to man-made fiber carpets.

## KEY POINTS

- Wool is naturally flame resistant, and its performance exceeds that of all other commonly encountered textile fibers
- Wool has a low energy release (heat of combustion) once combusted and a result is the low rate of heat release
- If wool comes into direct contact with another burning surface it won't melt or stick. It is also self extinguishing once the ignition source is removed
- Wool forms an insulating char when it burns and produces less smoke and toxic gases than are formed during the combustion of most man-made fibers.



**WHY WOOL IS A GOOD CHOICE**

Wool carpets have exceptionally low levels of flammability and are a sensible choice for creating safe and healthy indoor environments.