

The Multiple Roles of Natural Fibre Insulation

Futurebuild 2022

Mark Lynn

Vice-Chair

The Alliance for Sustainable Building Products

Managing Director

ERI Ltd - Thermafleece

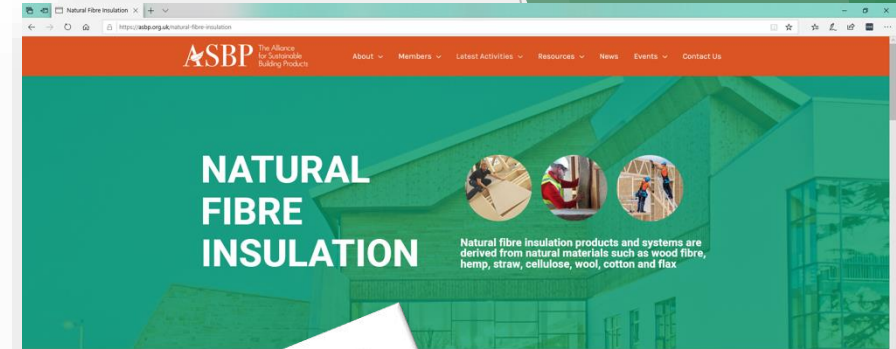
NATURAL FIBRE INSULATION GROUP

An industry collaboration to better communicate the benefits of natural fibre insulation products and systems

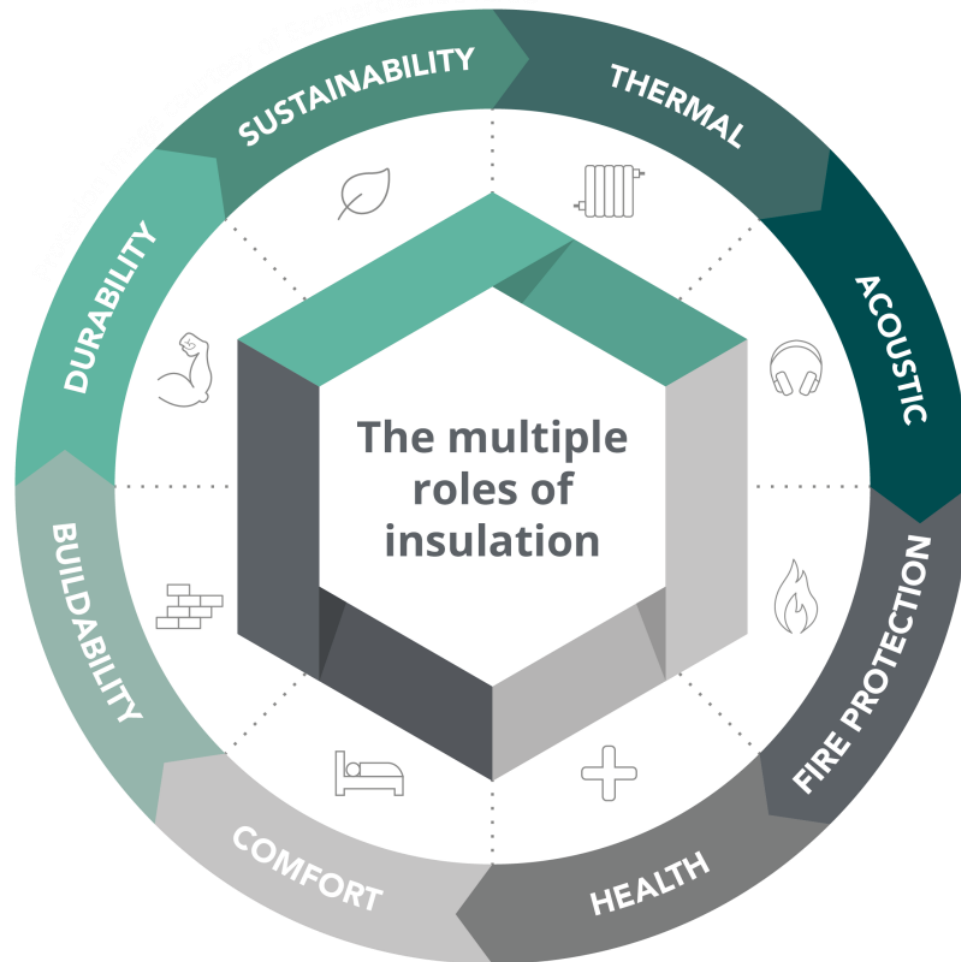


Aims & Outputs

- ▶ Collaborative market development activities
- ▶ Briefing papers
- ▶ Events, CPDs, workshops
- ▶ Training (online training portal in 2022)
- ▶ Market intelligence/insight
- ▶ Policy



The Multiple Roles of Insulation



Thermal Performance

1. **U-value** - based on steady state thermal conductivity measurements.
2. **Annual Energy Saving (AES)** - based on performance versus uninsulated element.
3. **Phase Shift** - based on thermal mass/specific heat capacity of insulated element. Aim to get internal and external heat cycles out of phase.

COMPLETE PICTURE = 1+2+3

Embodied Carbon

Biogenic Carbon

- ▶ NFI - Cellulose, Hemi-cellulose, Lignin, Keratin.
- ▶ Each is 50% Biogenic Carbon = 183% CO₂ equivalent.
- ▶ 1kg natural fibre stores contains 0.5kg biogenic carbon storing 1.8kg of CO₂.

Environmental Product Declaration

- ▶ 3rd party verified & publicly available.
- ▶ Quantified biogenic carbon.

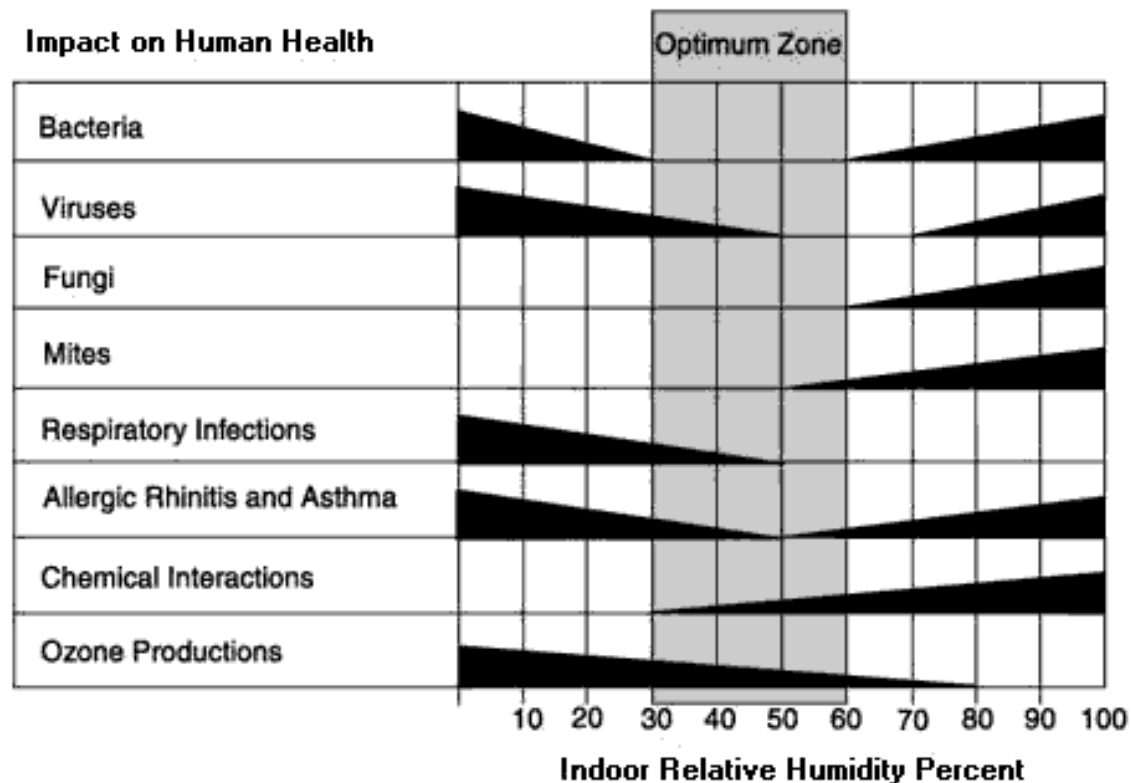
Value of Biogenic carbon

- ▶ Dynamic LCA
- ▶ RICS Whole Life Carbon Assessment



Humidity Regulation

- ▶ Moisture can cause health problems and damage the building fabric
- ▶ Breathable materials help keep humidity within the optimum zone for human health.
- ▶ Breathable materials bind moisture in a harmless way.



Breathable Natural Fibre Insulation

- ▶ Adjusts its moisture content to be in balance with surrounding humidity. Adjusts surrounding humidity to be in balance with its moisture content.

NFI adsorbs moisture



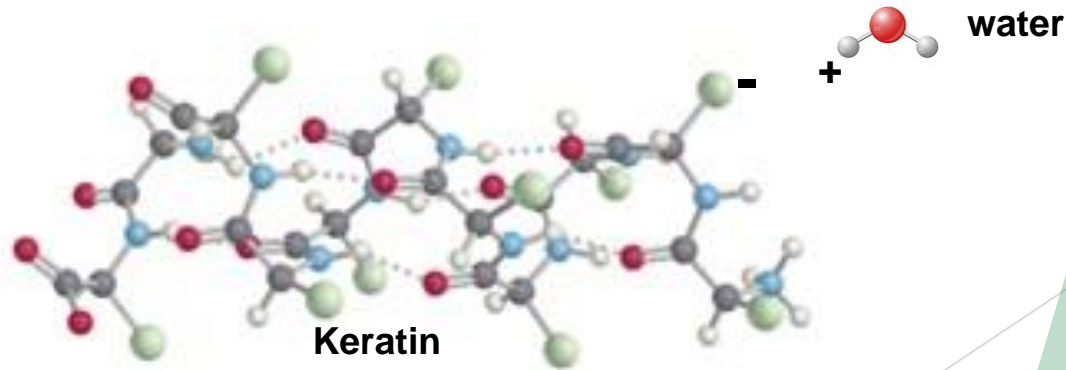
Higher relative humidity

NFI desorbs moisture



Lower relative humidity

- ▶ Is able to bind water molecules in a harmless way.



- ▶ Is vapour open

Low VOC's

Parameter	3 Day			28 Day		
	Thermally Bonded Sheep's Wool	Thermally Bonded Flexi Wood Fibre	AgBB Requirement	Thermally Bonded Sheep's Wool	Thermally Bonded Flexi Wood Fibre	AgBB Requirement
TVOC	< 0.01 mg/m ³	2.0 mg/m ³	≤ 10 mg/m ³	< 0.01 mg/m ³	2.0 mg/m ³	≤ 1 mg/m ³
Carcinogenic compounds	< 1 µg/m ³	<1 µg/m ³	≤ 10 µg/m ³	< 1 µg/m ³	<1 µg/m ³	≤ 10 µg/m ³
Formaldehyde	< 0.01 mg/m ³	< 0.01 mg/m ³	-	< 0.01 mg/m ³	0.019 mg/m ³	≤ 0.12 mg/m ³

Parameter	Wood Fibreboard (under floor)			
	3Day	AgBB Requirement	28 Day	AgBB Requirement
TVOC	0.52 mg/m ³	≤ 10 mg/m ³	0.02 mg/m ³	≤ 1 mg/m ³
Carcinogenic compounds	< 1 µg/m ³	≤ 10 µg/m ³	<1 µg/m ³	≤ 10 µg/m ³
Formaldehyde	< 0.01 mg/m ³	-	0.003 mg/m ³	≤ 0.12 mg/m ³

Acoustic Absorption

Product	Thickness	Practical Absorption Coefficients (BS EN ISO 354:2003)						
		125 Hz	250 Hz	500 Hz	1kHz	2kHz	4KHz	α_w
Rockwool RWA45	50 mm	0.1	0.54	1	1.05	1.04	1.02	0.85
Thermally Bonded Sheep's Wool 31kg/m ³	50 mm	0.2	0.55	0.85	0.9	1	1	0.85

- ▶ Sheep's wool has similar performance to Rock at 70% of the density.

Fire

- ▶ NFI's treated with inorganic mineral based fire retardants - free from halogens, formaldehyde & organo-phosphorus.
- ▶ NFI's are appropriate to use in accordance with relevant sections of Part B of UK Building Regulations.
- ▶ NFI's don't play a role in the developmental stages of a fire.
- ▶ NFI's have natural charring behaviour which limits flame spread.

Sign up to our newsletter, download briefing papers and see our conference presentations at:

www.asbp.org.uk



The Alliance
for Sustainable
Building Products

Contact ASBP

www.asbp.org.uk

info@asbp.org.uk

+44 (0)20 7704 3501

@asbp_uk

Contact me

Mark Lynn

mark@thermafleece.com

+44 (0)17684 86285

Bio and Circular Insulation for Resourceful Construction (BIO-CIRC)

We are a partner in a 2 year EU-funded Interreg research project called BIO-CIRC.

- ▶ Investigate the waste bedding sector and the reuse of a problematic waste source - polyester duvets, resulting in the development of 3 novel insulation prototypes.
- ▶ Conduct market intelligence of the insulation market to identify growth opportunities for natural and recycled fibre insulation (NRFI) materials.
- ▶ Review air quality and health & well-being characteristics, and raise awareness of the benefits of NRFI amongst our diverse networks of construction professionals.

Interreg  EUROPEAN UNION

France (Channel
Manche) England



The project has been awarded by Interreg France (Channel) England, which is co-financed by the European Regional Development Fund (ERDF), who will fund 80% of the project budget (€399,600).

nomadéis 

ASBP

BACKTOEARTH
Building Performance Specialists

**therma
fleece**
Nature's finest insulation

ASBP The Alliance
for Sustainable
Building Products