



European Union
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Eco-Creativity, Natural Fibres & Short Value Chains

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The Worlds only Natural Fire Retardant System

Camira Fabrics

- **Textile Manufacturer and Textile Innovator**
- **Recognised for design and manufacture of the most innovative, adventurous and environmentally sensitive fabrics in the world**
- **Manufacturing sites in UK and Lithuania**
- **Showrooms in Europe, North America, Australia and China**
- **Manufacture 8 million metres of fabric per year**
- **Meet international flammability regulations, celebrating colour, design, technical and environmental innovation**
- **Registered to ISO 9001 and 14001 standards**

Combining Animal and Plant Fibre to create a Fire Retardant Product



STING

- Sustainable Technology In Nettle Growing
- Partnership between Camira and De Montfort University, Leicester, UK
- Developed an Industry 1st Fabric made from wool and nettle fibre obtained from the common stinging nettle
- Encompassed research into nettle cultivation on UK farmland
- Harvesting methods, fibre extraction, blending, spinning, weaving and dyeing
- Technical performance evaluation and lifestyle assessment

Nettle Facts

- Nettles grow rapidly from springtime up to a height of 2.5m
- They grow easily on land which is unsuitable for arable crops
- Require no pesticides or herbicides
- Fibre extracted by process known as Decortication
- The woody remnant after fibre extraction is used as animal bedding
- The leaves from the plant are ploughed into the soil as fertiliser
- Nettle cultivation encourages bio-diversity, providing a natural habitat for birds and insects.

Hemp

- Grown as an Agricultural Crop under Licence from UK Government Home Office
- Sown from seed rather than from cuttings
- Faster sowing to harvest cycle
- After harvesting, the long stems are left in the fields in bundles, while the leaves decompose and act as a fertiliser for the next crop
- Dew retting begins the process which is completed by mechanical decortication
- Blended with wool in a 60% wool 40% hemp mix, can be dyed to many colours

Hemp Facts

- Grown from the Cannabis Sativa strain containing only minute traces of THC
- One of the fastest biomasses known, reaching over 3m in only 120 days
- 45kg of seed per hectare of land. Produces 6 tonnes of hemp straw which yields 1 tonne of textile fibre
- In a 60/40 mix, 1 tonne of fibre produces 5400m of fabric
- Hemp fibres are soft, long and strong
- Hemp fibres were used to make sailors' uniforms during the British Empire era

Jute

- Second only to Cotton in terms of Global production and consumption of plant based textile fibres
- Used for bags, ropes, carpets, rugs and for hessian sacks for transporting coffee and cocoa beans
- No shortage of hessian sacks, used in their millions
- Can be reprocessed through mechanical recycling machines to turn back into raw fibre
- Create a new generation of yarns and fabrics when blended with wool which are both renewable and recycled



Jute Facts

- Golden brown colour and its value have led it to be referred to as the 'Golden Fibre'
- Largest producers are India and Bangladesh
- Jute grows to the tallest of the Bast Fibres reaching 3.5m tall when harvested
- Jute is used as a Geo-textile to providing stability against soil erosion and landslides



Wool

- Wool's smart abilities are well documented
- Retains its appearance for longer
- It has natural crimp, stretch, drape and handle
- It is breathable and can absorb and evaporate moisture
- It is difficult to ignite and forms a char against flaming
- It is this ability which is enhanced further still in wool/bast fibre blends

Wool Facts

- Average fleece produces approximately 4kg of fibre which can make up to 10m of fabric
- All textile fibres were derived from natural sources but Polyester consumption is now over 50 times that of wool
- Wool is easily biodegradable within 1 year whilst synthetics can take centuries to decompose
- Sheep are found all over the world in most climate conditions



Material selection – summary

Energy consumption and CO₂ emissions

Fibre type	Energy consumption kWh / kg fibre	CO ₂ emissions kg per kg fibre
Nylon	69	37
Acrylic	49	26
Polyester	35	19
Polypropylene	32	17
Viscose	28	15
Cotton	15	8
Wool	13	7
Nettle	9	5
Hemp	5	3

Source: Barber & Pellow, Life Cycle Assessment – New Zealand Merino Industry (2006), except Nettle Energy Consumption: Central Science Laboratory, Comparative LCA Nettle, Flax, Hemp. CO₂ emissions based on Defra UK grid rolling average (0.537kg CO₂ per kWh) (2008)



Crib 5 Test

- The combination of bast and wool makes for an inherently flame retardant fabric which requires no chemical treatment.
- The video showed how a wool/hemp fabric (left) compared against a 100% wool fabric during the crib 5 Medium Hazard test
- Crib 5 Test is the Performance Standard BS 7176 Medium Hazard.
- Paper-cushion test DIN 54341 is the German equivalent and Wool/Bast Fibre blends pass these Standards too.
- The fabric on the right failed the 10 minute test because the foam had burnt through its full thickness whilst the wool/hemp exhibited much less burning and achieved an excellent pass.

Flaming Marvellous

- Flammability probably the most important technical standard a fabric has to meet
- Wool/Bast fibre fabrics in combination enhance the natural flame retardency of wool by creating a stronger char between the flame and the foam cushion
- It is the foam which acts as fuel to the fire and gives off toxic fumes
- Wool/Bast fibres require **no** chemical treatments or back coatings



“Look deep into nature
and you will understand
everything”

Albert Einstein

- Wool, in it's original state, is designed for purpose
- It's the same with hemp fibre!
- Together they form a natural and complementary composite in terms of:
 - Performance
 - Appearance
 - Handle
 - Flexibility of use
 - Sustainability

Flammability

- Inherently Crib 5/Medium Hazard





RESET

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Thank you!

Questions welcome



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