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Media Release

The TTNA launches a program on textile lightweighting technology

Monday 24th Sept 2012: Lifecycle thinking is being applied to identify where it's important to lightweight, and to determine other design strategies to reduce material use and the embodied energy within products. In recognition that lightweighting is being applied to all manufactured goods - from packaging (including plastic bottles) to soldier's uniforms - the TTNA is conducting an analysis of fibre and textile lightweighting technology on manufactured componentry that will conclude with recommendations for integration into fibre and textile industry through education

Designing and manufacturing commercially viable lightweight products, whilst maintaining and improving specified performances, remain top priorities particularly for the automotive and aerospace industries as they battle to meet stringent carbon emissions targets and fulfil consumer demands for fuel efficiencies.

For the fibre and textile industries, the issue is threefold. Firstly, textiles can be used as an alternative to traditional materials. For example, while aeroplanes were once made from steel and aluminium, each Boeing 787 Dreamliner is made from carbon fibre reinforced plastic (CFRP), requiring 23 tons of carbon fibre. Carbon fibre composites have a higher strength-to-weight ratio than traditional aircraft materials, and help make the 787 a lighter aircraft that uses less fuel. Secondly, lightweighting is a hedge against the cost fluctuations of synthetic (oil based) fibres and natural (cotton and wool) fibres and textiles. Thirdly, there is a drive to lighten functional textiles, particularly protective textiles. The elements of functionality and weight are being redefined by light weight soldier technology for military apparel that considers cost, human factors and soldier fatigue.

Increasingly engineers, architects and designers are considering alternative inputs as a solution to lessen the embodied energy of industrial componentry, industrial textile applications and performance apparel. This has implications on the traditional education on fibres and textiles.

Lightweighting covers all textile technology including fibre and yarn production, knitting, weaving and non woven production across all synthetic and natural raw materials. It can cover technology that creates porosity through air in dense structures (foam like properties) or the use of different fibre blends and constructions. New technology is constantly being developed and applied.

Manufacturers of fibres and textiles need to respond to these demands. They are looking to the TTNA to take the lead by providing technical training aimed at helping manufacturers to better understand the changing marketplace.

Lightweighting knowledge will enable widespread adoption of advanced textiles and finding the most feasible routes to achieving scale.

The training will be practical, relevant to market needs and strategically linked to end users of technical textiles. This knowledge should raise the level of fibre and textile knowledge of those that work within the industry in order that sustainable products are produced.

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