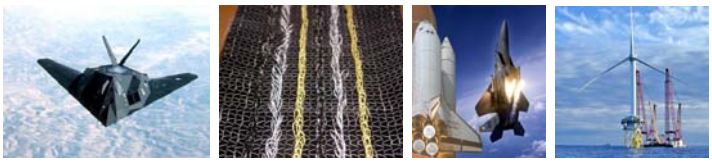


High Performance Fibres

Ultra-High Molecular Weight Polyethylene Fibers, Electrospun with Carbon Nanotubes
DM Rein, Y Cohen, J Lipp, E Zussman (Technion)
Successful preparation of the metastable at the elevated temperatures mutual solutions of ultra-high molecular weight polyethylene and suspension of carbon nanotubes in combination with electrospinning process using the novel device, allowed the manufacturing of nanocomposite nanofibers, reinforced with oriented self-organized nano-ropes from nanotubes. **(D6:1)**

Thermomechanical Behaviours of SiC Fibers
C Colin, V Falanga, K Shimoda, L Gélébart (CEA)
The purpose of this work is to describe the results obtained on SiC fibers by using MecaSiC device: we will discuss about the electrical conductivity, the elastic and viscoplastic properties, and the effect of the temperature or of ion irradiation on these properties. **(D6:2)**

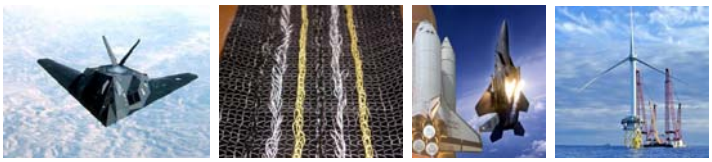
Tensile and Flexural Properties of Single Carbon Fibres
K Naito, Y Tanaka (NIMS) J-M Yang (Univ of California) Y Kagawa (Univ of Tokyo)
The tensile and flexural properties and fracture behaviour of ultrahigh tensile strength PAN-based (T1000GB), ultrahigh modulus pitch-based (K13D) and high ductility pitch-based (XN-05) carbon fibres have been investigated. The statistical distributions of the tensile and flexural strength were characterized. **(D6:3)**

Degradation of the Active Fibers in Soft Body Armor
G Holmes, J Kim, W McDonough, M Riley, K Rice (NIST)
Fibers extracted from soft body armor containing polybenzoxazole (PBO) fibers were analyzed for changes in mechanical properties. The data indicates that hydrolytic degradation is accompanied by folding degradation. This additional failure mechanism creates localized regions in the armor that are significantly lower than the homogeneous degradation caused by uniform hydrolysis. **(D6:4)**

Negative Poisson's Ratio Nanofibres and Nanotubes
YT Yao, K Alderson, A Alderson (Univ of Bolton)
Molecular Mechanics and Analytical Modelling methods have been employed to predict the structure and mechanical properties of crystalline cellulose Ibeta and single-walled nanotube structures. The models show good agreement with experiment for crystalline cellulose Ibeta. The conditions necessary for auxetic SWNT response are predicted and suggestions to realise this behaviour are made. **(D6:5)**

Effects of Different Drying Methods on Textural Properties of Nanocellulose Aerogels
H Jin, M Pääkkö, O Ikkala (Helsinki Univ of Technology) J Netral, LA Berglund (KTH) C Neagu, P-E Bourban (EPFL) M Ankerfors, T Lindström (STFI AB)
There is increasing research interest in nanocellulose aerogels because they have low density, hierarchical structure and they are biodegradable and biocompatible. Typically, aerogels are made by supercritical drying, freeze drying and vacuum drying. This work will report the effects that different drying methods have on textural properties of aerogels. **(D6:6)**

Direct Evaluation of Fracture Toughness in a Carbon Fiber
S Ogihara, Y Imafuku, R Yamamoto, Y Kogo (Tokyo Univ of Science)
A new measurement technique was proposed to estimate fracture toughness of a carbon fiber. FIB (focused ion beam) technique was used to introduce a notch on a carbon fiber. Finite element stress analysis was used to calculate the fracture toughness. **(D6:7)**



Strain Mapping of High Performance Fibres in Textile Architectures
K Rashed, RJ Young, P Potluri, YT Shyng (Univ of Manchester)
This paper investigates the influence of interlacing architectures on micro- and meso-scale strain distribution in high performance fibres (Kevlar, PBO, Vectran) using Raman spectroscopy. Influence of matrix type - dry, lightly coated, flexible or rigid - on interfacial properties has also been investigated. **(D6:8)**

A Constitutive Model for Dyneema UD Composites
L Iannucci (Imperial College London) DJ Pope, M Dalzell (DSTL)
The mechanical properties and overall material response of Dyneema UD composites has been investigated. The relevant tests indicate that Dyneema UD has very low compressive and shear strengths. A new constitutive model has been developed and implemented into the ls-dyna Finite Element code and used to simulate ballistic impacts. **(D6:9)**

Oxide Fibres for High Temperature Applications
S Mileiko, A Kolchin, V Kiiko, A Tolstun, N Prokopenko (Russian Academy of Sciences)
Single crystalline oxide and oxide eutectic fibres are certainly the best reinforcements for heat-resistant composites. They can be obtained by using the internal crystallisation method. Some new results of the study of the crystallisation process under special conditions of the method are reported that yield the fibres of high creep resistance at temperatures up to 1600oC and sufficiently high strength. An example of the application of the ICM-fibres in Ni-based matrix is presented. **(D6:10)**

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