Polymer Composites

Technical Work Area 5

Call for Participation

Project 3

Measurement of Multiaxial Properties of Polymer Composites

Objectives

The objective of this project is to propose suitable methodologies that will lead to internationally accepted test methods for the evaluation of multiaxial strength of fibre-reinforced composites. It is envisaged that these will form the basis of a new international standard.

Background

There are several methods of creating multiaxial loads, including;

- use of axial forces and pressure (internal/external)
- use of tube specimens
- biaxial plate
- cruciform type biaxial configurations
- full rig systems (combinations of axial/bending/twisting loads).

The biaxial loaded cruciform specimen has been identified as of most interest currently.

Standardization Needs

The introduction of fibre reinforced composites has identified the importance of mechanical properties due to fibre direction. In use, these materials are often combined in a multi-directional laminate. The resulting properties are difficult to evaluate by traditional unidirectional methods and as a result often non-conservative.

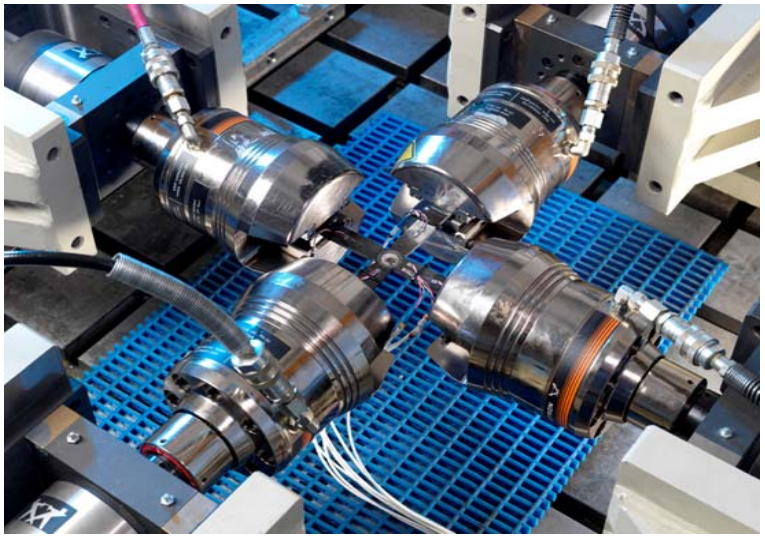
Currently there is no standard protocol in place. Several European Laboratories are proposing standard methods and the task of this project will be to encompass and consolidate these into a single procedure for each loading mode.

Work Programme

The initial phase of the programme will survey the current activities and methods and provide a forum for discussion.

It is anticipated that a single work area will be identified initially, with the biaxial loaded cruciform of particular interest. Initial evaluation of available methods will be undertaken by the principle partners, while participation is obtained more widely.

Within this forum, a guidance sheet will be outlined giving a methodology based on previous validated information as to the benefits and limitations of biaxial evaluation. The proposed testing protocol for the round-robin will use ISO 5725 "Accuracy (Trueness and Precision) of Measurement Methods and Results.



Deliverables and Dissemination

The initial dissemination will be through the VAMAS web-site, international conferences and international standards committees.

Funding

Participation is based on in-kind contributions from the partners.

Project Leader

Caroline Williamson and Andrew Clarke (QinetiQ, UK)

International Participants

Vrije Universiteit Brussel (Belgium)
National Physical Laboratory (UK)
AIRBUS UK
Ghent University (Belgium)

Status

Interlaboratory trial in progress. Call for additional participation.

For more information on participation, please contact:

Dr. Bill Broughton
Chair, TWA5 - Polymer Composites
Email: **bill.broughton@npl.co.uk**

www.vamas.org

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