University of BRISTOL

Bristol Composites Institute (ACCIS)

ACCIS ADVANCED COMPOSITES COLLABORATION FOR INNOVATION & SCIENCE

Work supported by HEXCEL®

The Effects of Interleaf Architecture on Composite Toughness

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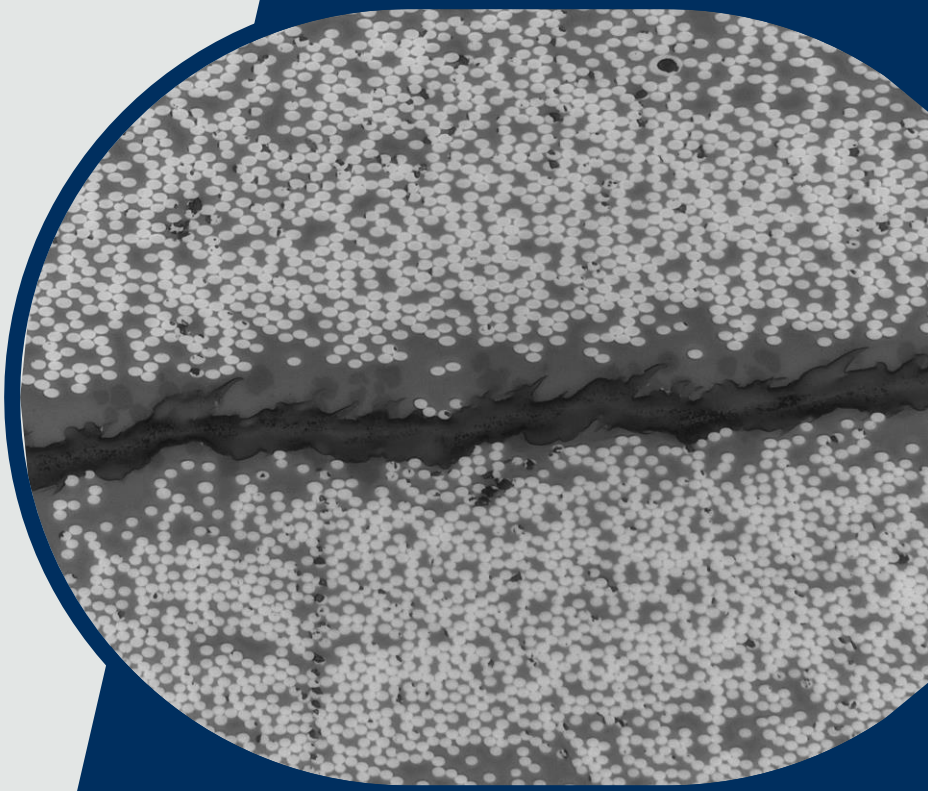


Background

Impact performance

- Limited by interlaminar toughness
- Toughen by interleaving
- Interleaves readily formed with particles

How does changing interleaf architecture affect interlaminar toughness?

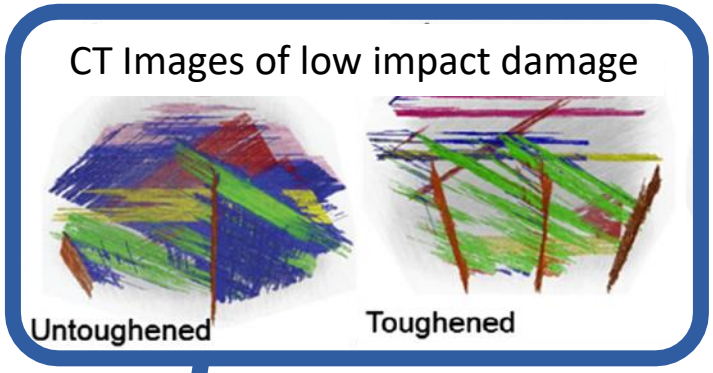


Image: Bull et al. 2013

Motivation

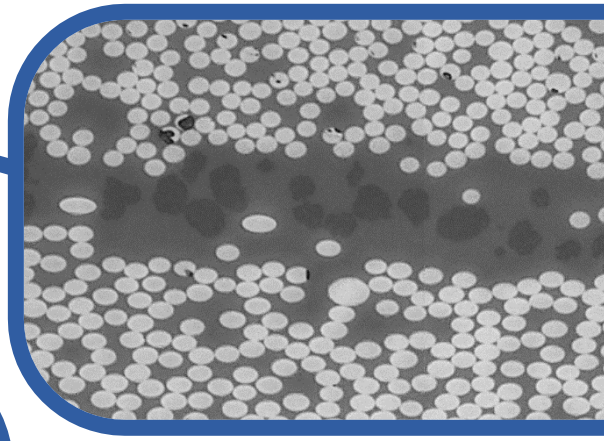


Image: airbus.com

Background

Aims

Role of:

- Interleaf thickness
- Particle material (rigid vs soft)
- Particle loading
- Mode I vs mixed mode loading

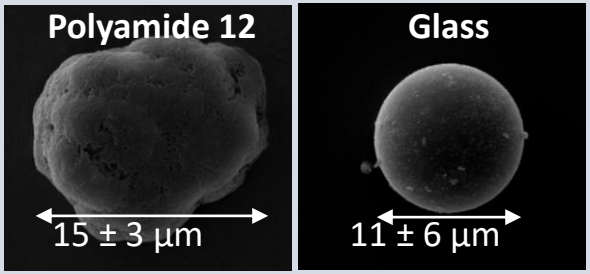
→

- **Toughness**
- **Toughening mechanisms**
- **Crack path**

Approach

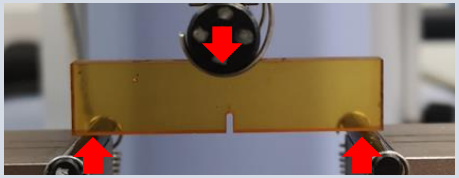
Constituents

- High T_g epoxy
- Thermoplastic toughened
- Micro particles:

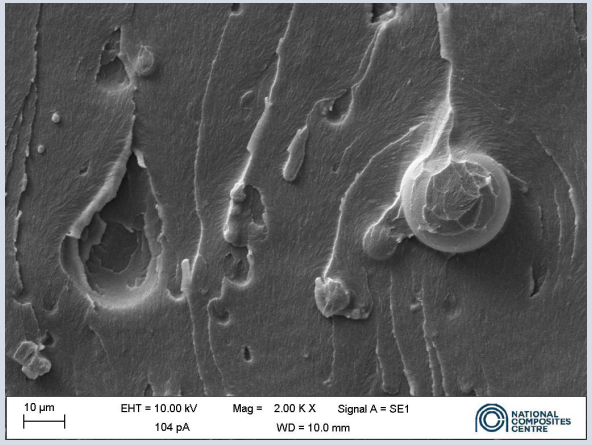


Polymer toughness

- Polymer SENB testing:

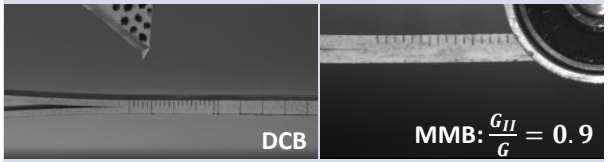


- SEM fractography:

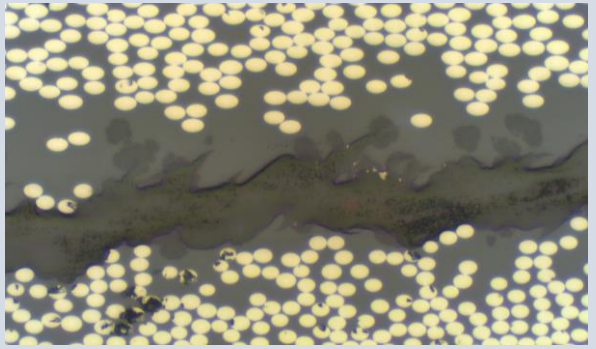


Composite toughness

- DCB/MMB Testing

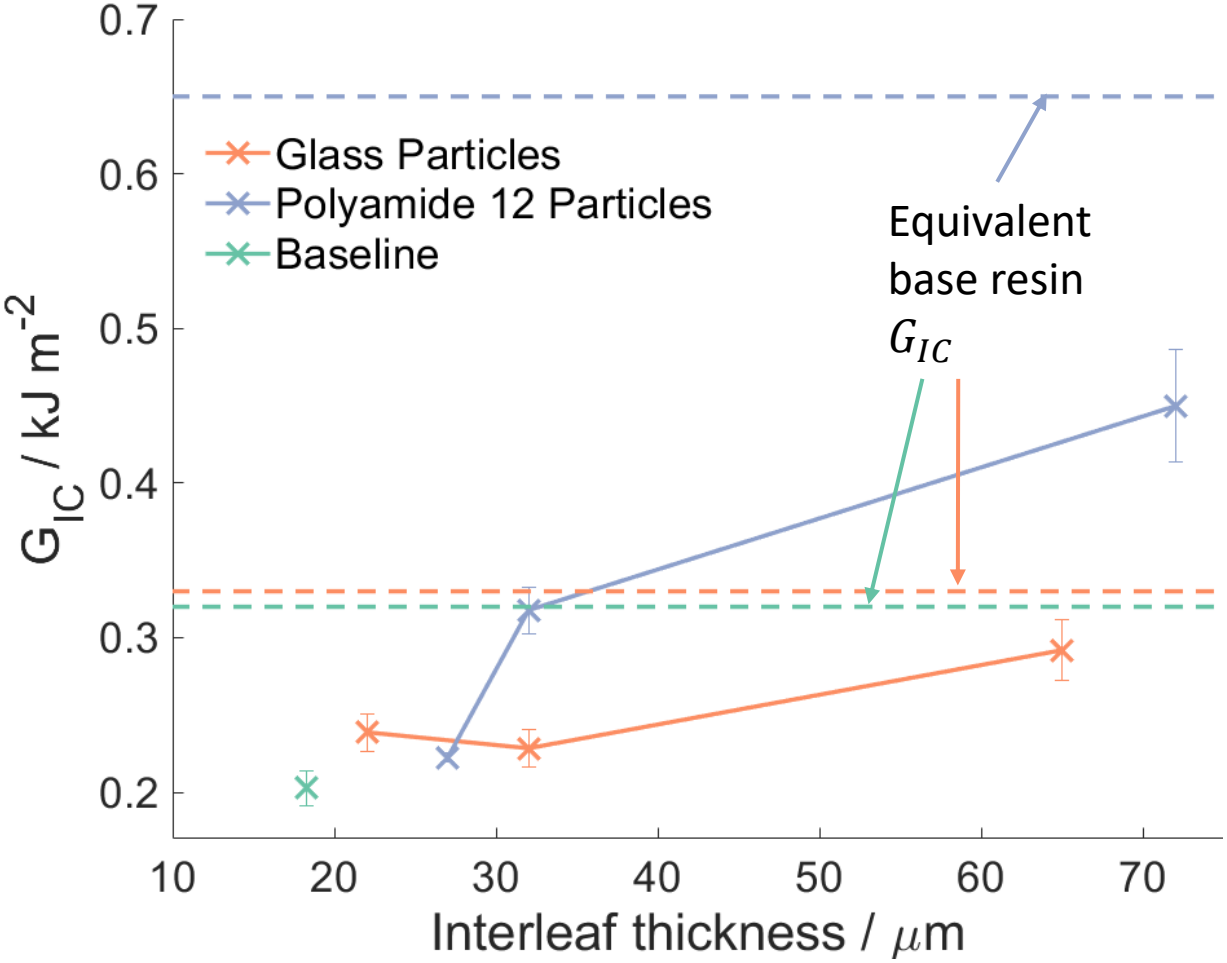


- Crack path and fracture surface analysis

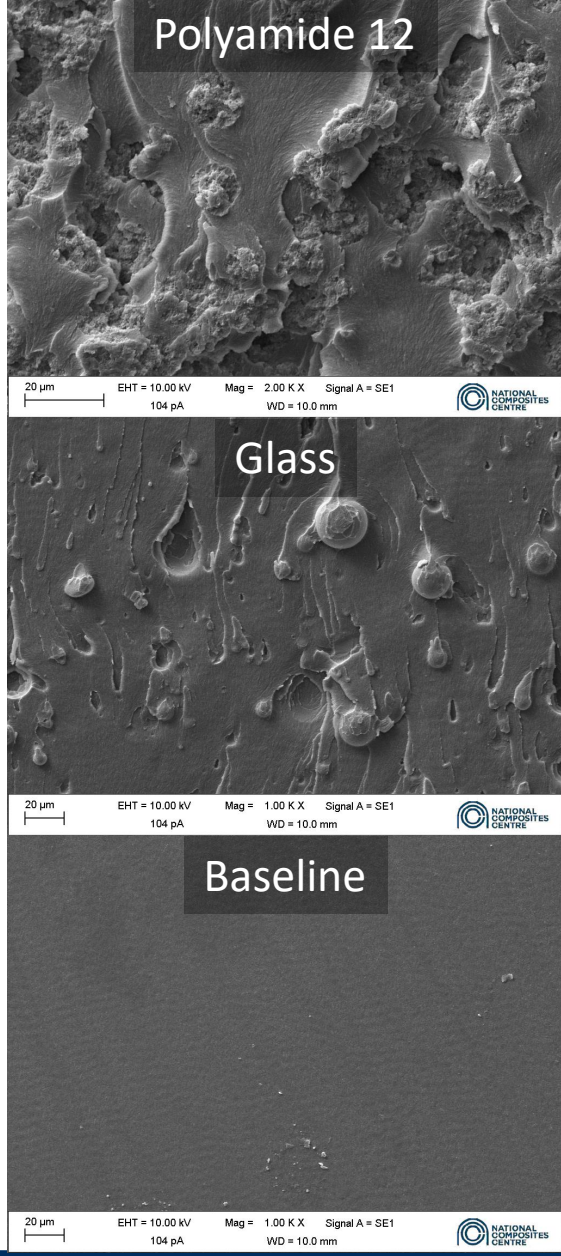


Results

Composite G_{IC} vs Interleaf Thickness



SENB Fracture Surfaces:



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