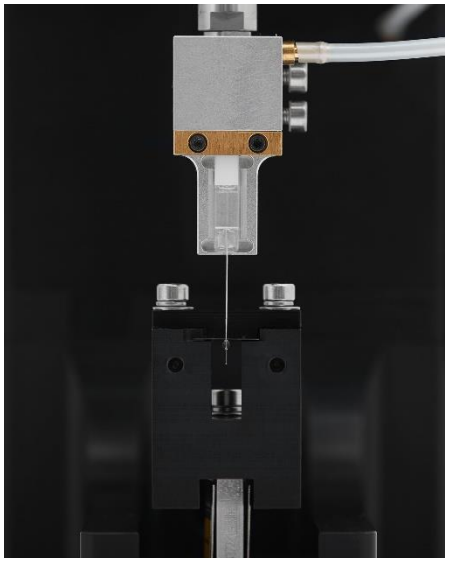
Interfacial Shear Strength (IFSS) Module for LEX820



The Dia-Stron Interfacial Shear Strength module (IFSS) is an interchangeable module for the LEX820 high resolution extensometer used to measure the debonding force of micro-droplets on single filaments and fibres.

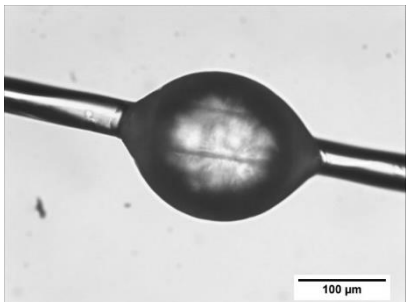
General Information

Principal Features

- 50mm linear travel
- Highly accurate speed control
- 2.5N & 20N load cells available
- Standard set of shearing plates

Principal Benefits

- Exceptionally smooth travel
- High positional repeatability
- Detailed debonding data



Above: Lyocell fiber with polypropylene droplet (Courtesy of Hochschule Bremen)

Introduction

Fibre-matrix interfacial properties are critical to achieving high composite material performance. The IFSS module is an interchangeable accessory designed to measure the debonding force of micro-droplets on single filaments and fibres.

The IFSS measurement is based on the universally recognised micro-bond method, which evaluates the interfacial properties between matrix resins/epoxies on fibres and filaments commonly used in composite materials. The IFSS method can be applied to various fibre and filament types: glass, carbon, ceramic, aramid, basalt or natural fibres.

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Specifications

LEX820	
Extension range	3 – 53mm
Speed range	0.01 to 2.6mm/sec
Force range	0 to 2.5N or 0 to 20N
Force resolution	0.05mN (2.5N) 0.5mN (20N)
Displacement resolution	1µm
Displacement accuracy	50µm
Load cell linearity	±0.1% full scale

Shearing plates

Standard shearing plate slot sizes	• 50µm • 80 µm • 100 µm • 200 µm

Content

LEX820 Instrument
IFSS Module
UV1000 Control unit
PU1100 Pneumatic unit
UvWin software for Windows OS

Requirements

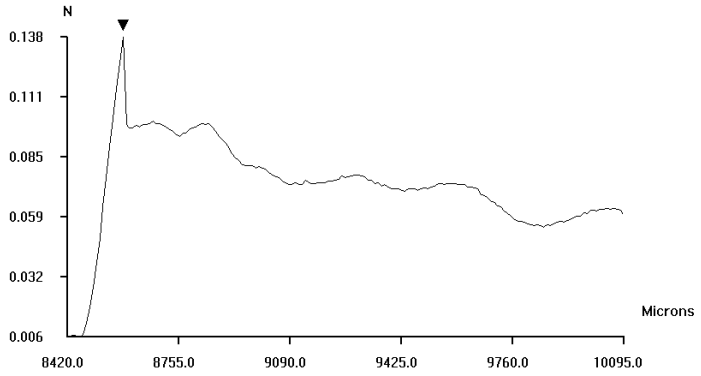
Power Supply	85-265vac 47-63Hz, 100W
Compressed Air	• Dry & clean • 4.5 Bar • 20 l/min
Computer	• OS: Windows 7, 10 • 1 x USB port

IFSS Module

The IFSS module uses interchangeable precision laser cut tungsten plates to support the micro-droplet whilst the specimen is withdrawn through. The force being applied by the micro-droplet to the plate is recorded by the load cell until interfacial failure. The sample is secured at the other end using the Dia-Stron one-part plastic tab system and held in place using pneumatic sample covers.

Dedicated software – UvWin

UvWin 4 software controls the IFSS system. Method parameters can be easily edited within the software. UvWin enables automatic correction for system compliance.



Debonding data for a polypropylene droplet from a Lyocell fibre

UvWin also offers a number of integrated data processing tools to analyse the data. The raw data can also be exported.

Sample Mounting

Samples are mounted using the Dia-Stron one-part plastic tab system. Please note: it is the responsibility of the user to apply micro-droplets using thermoplastics or thermosets on the fibre when using the IFSS module.

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