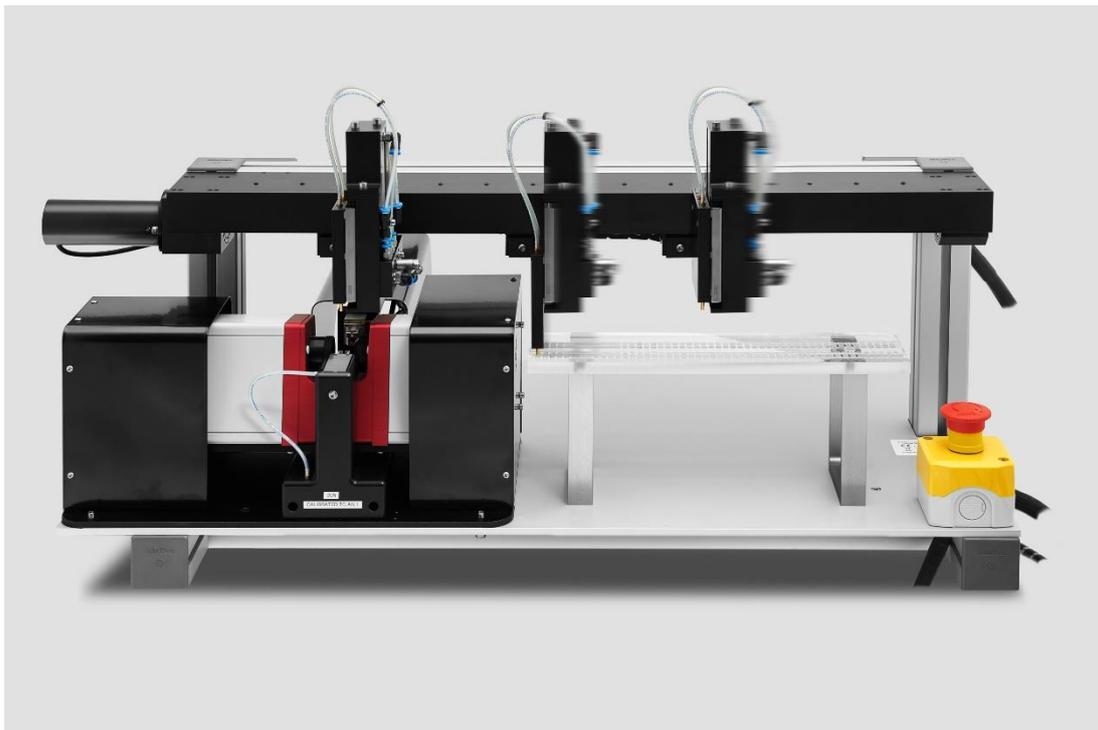


Automated LEX/LDS System



The Dia-Stron LEX/LDS System is a cassette based automated dimensional and tensile instrument for technical fibres or filaments.

General Information

Principal benefits

- Direct diameter measurement
- Manual/Automated sample loading system
- High throughput, 40/50 specimen cassette
- Post-testing specimen recovery
- Small footprint & low weight
- Easy to set-up & use
- Low maintenance & robust

Application examples

- Single carbon filament tensile testing
- Diameter measurement of ultra-fine wires

System Description

The LEX/LDS system was developed to overcome the low productivity associated with the manual testing of mechanical properties of single fibres or filaments. The system is based on a linear sample cassette, which allows the manual or automatic measurement of up to 50 pre-mounted fibre specimens. The LEX/LDS instrument is supplied as a complete system comprising mechanical unit, control unit, pneumatics unit, and software for Windows OS.

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Specifications

LEX820 Module

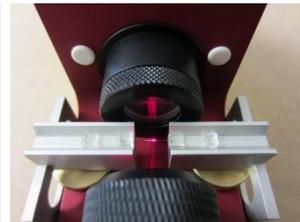
Extension range	3-53mm
Speed range	0.01 to 2.6mm/s
Extension Force range	0 to 2.5N 0 to 20N
Force resolution	0.05mN (2.5N) 0.5mN (20N)
Displacement resolution	1µm
Displacement accuracy	50µm
Load cell linearity	±0.1% full scale

LEX820

The LEX820 is a high resolution extensometer developed for fine fibre applications. At its heart, a DC micrometer drive offers exceptionally smooth travel combined with high positional repeatability. The module is designed for fibres which fail at low strain values with highly detailed stress/strain data.



LEX820



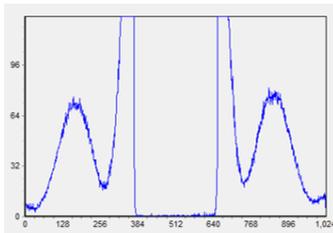
LDS0200

LDS0200 Module

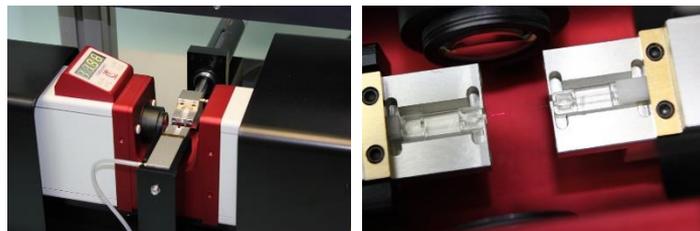
Measurement range	5 to 100µm
Diameter resolution	0.01µm
Diameter repeatability	±0.03% of the diameter

LDS0200

The LDS0200 is designed for direct, non-contact diameter measurements. The measurement principle is based on laser diffraction which enables diameter measurements down to a few microns. The LDS0200 is calibrated, temperature compensated and insensitive to vibrations due to the high speed scanning rate.



Typical diffraction pattern for a single carbon filament of 7µm. Measurement is derived from analysis of the pattern fringes.



Integration of the LDS0200 with the LEX820

The LDS0200 and the LEX820 are integrated into one metrology module to guarantee the specimen straightness and orthogonality with the laser beam for high precision diameter measurements. The unique LDS0200 tilting platform ensures that misalignment due to specimen mounting is automatically corrected.

Manual/Automated Sample Loading System

Capacity	Up to 50 specimens
Specimen gauge lengths	4, 12, 20, 30mm or 4, 12, 25mm
Specimen mounting	1-part/2-part plastic tabs

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Overall width	800mm	Automated (ALS1500) Sample Loading System The main purpose of the sample loading system is to transport efficiently and safely fragile specimens from the storage cassette to the metrology modules. The manual loading system (MLS1500) is an economical version of the ALS1500: the pick and place actions are performed manually. Both loading systems use a vacuum suction to transport specimens from the storage cassette to the measurement modules. The sample loading system offers a set of specimen gauge lengths to accommodate most applications. After testing, specimens can be either discarded or placed back onto the storage cassette for further inspection.
Overall depth	500mm	
Overall height	400mm	
Overall weight	15kg	
Programmable Features		
Methods	<ul style="list-style-type: none"> Stress/Strain Stress relaxation Creep Hysteresis 	
Content		
UV1000 Control unit PU1100 Pneumatic Unit Sample Loading System LEX/LDS Module USB and Power cords UvWin software for Windows OS		The main benefits from the automated sample loading system: <ul style="list-style-type: none"> High testing productivity Improved data quality Specimen integrity Safety and ergonomics
Requirements		Dedicated software – UvWin
Power	85-265vac 47-63Hz, 100W	UvWin 3 software controls the measurement system. Several methods can be run on the system such as tensile, hysteresis, stress-relaxation, and creep tests. Parameters for these methods can be easily edited within the software. UvWin enables automatic data correction for system compliance. The raw data can be exported as a text file.
Compressed Air	<ul style="list-style-type: none"> Dry & clean 4.5 Bar 20 l/min 	
Computer	<ul style="list-style-type: none"> OS: Windows 7, 10 2 x native USB ports 	
		<p><i>Tensile data for a 7µm carbon filament (20mm gauge length)</i></p>

Analysis Tools

- One phase
- Three phase
- Weibull
- Hysteresis
- Stress Relaxation

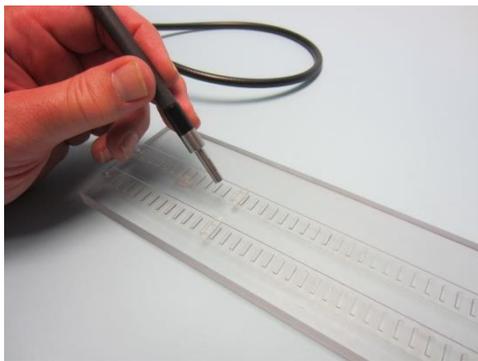
Testing standards

The Dia-Stron LEX/LDS system is compatible with the following standards:

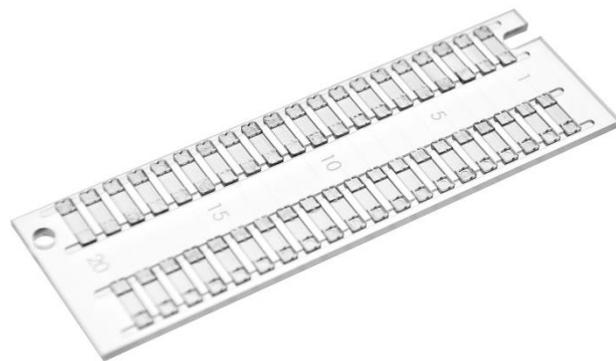
- ISO 11566: Determination of the tensile properties of single-filament specimens
- ASTM D 3822-07: Standard Test Method for Tensile Properties of Single Textile Fibres
- ASTM C 1557-03: Standard Test Method for Tensile Strength and Young's Modulus of Fibres
- JIS R 7601: Testing Methods for Carbon Fibres

Sample Preparation

Dia-Stron offers a complete testing solution. To that effect, a range of sample preparation aids have been developed. Sample mounting utilises our **plastic tab system** to align, mount and secure samples in place. A fine fibre selection and **pick-up pen** assists with filament separation and transport to a **vacuum mounting station** to securely hold the sample prior to mounting. When UV curing adhesives are used, a **digital dispensing device** helps with consistent and repeatable dosing. Once mounted on the **tab cassettes**, sample handling errors are reduced by locating directly onto the automated system, allowing for our ALS1500 automated system to test samples consecutively.



UV curing of samples on a 50-slot cassette



Mounted fibre samples on a 20-slot cassette

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