

Agilent Continuous Dynamic Analysis (CDA) Option

Data Sheet



Agilent CDA option.

Features and Benefits

- Enables mechanical properties to be determined continuously as specimen is strained
- Seamless compatibility with Agilent T150 UTM
- Allows complex moduli to be measured at various preload values over a range of strains
- Operation over a range of frequencies permits better understanding of viscoelastic response of materials

Applications

- Dynamic studies of compliant fibers
- Dynamic studies of biological materials
- Dynamic studies of polymers and composites

Continuous Dynamic Analysis (CDA) Option

Until recently, accurately determining dynamic properties for specimens at the nanoscale has been limited to fixed-strain investigations — posing significant technical challenges for improving the understanding of material behavior.

The Agilent Continuous Dynamic Analysis (CDA) option provides a simple means of determining dynamic properties, such as storage and loss modulus and $\tan \delta$, with the Agilent T150 UTM. This innovative option utilizes a technique whereby a nanomechanical actuating transducer head applies an oscillatory force that is superimposed over the nominal force. The amplitude of the oscillation is measured by a capacitive sensor that is an integral part of the nanomechanical actuating transducer head. As a result, the technique can be used to impose oscillatory forces at a higher frequency than is achievable by imposing an oscillation via the crosshead. CDA also provides the advantage of measuring complex moduli over a range of frequencies.

The CDA option offers a direct, accurate measurement of the specimen's stiffness at each point in the experiment, enabling mechanical properties to be determined continuously as the specimen is strained. By measuring both the amplitude and phase relationships between the load and displacement oscillations, the CDA option makes it possible to determine storage and loss modulus. The option enables T150 UTM users to gain access to dynamic properties information continuously through the force curve, providing a wealth of information on the material's response.



T150 UTM

The state-of-the-art Agilent T150 UTM enables researchers to understand dynamic properties of compliant fibers via the largest dynamic range in the industry and the best resolution on the market (five orders of magnitude of storage and loss modulus). It also lets researchers investigate tension / compression properties of biological materials via the CDA option.

T150 advantages include fast, accurate generation of real-time test results, improved understanding

of strain-rate-sensitive materials and time-dependent response, and improved statistical sampling in biomaterials applications.

Every T150 UTM is backed by highly responsive Agilent Technologies customer service personnel. Knowledgeable and experienced regional applications engineers are available to guide users through more advanced testing, provide outstanding technical support, and offer unmatched applications expertise.

www.agilent.com

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/nano

Americas

Canada	(877) 894-4414
Latin America	305 269 7500
United States	(800) 829-4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	81 426 56 7832
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe

Austria	0820 87 44 11
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700
Germany	01805 24 6333* *0.14€/minute
Ireland	1890 924 204
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
Switzerland (French)	44 (21) 8113811(Opt 2)
Switzerland (German)	0800 80 53 53 (Opt 1)
United Kingdom	44 (0) 7004 666666

Other European Countries:

www.agilent.com/find/contactus

Figure 1. Viscoelastic time-dependent behavior of small diameter compliant fibers using the CDA option over a range of strains.

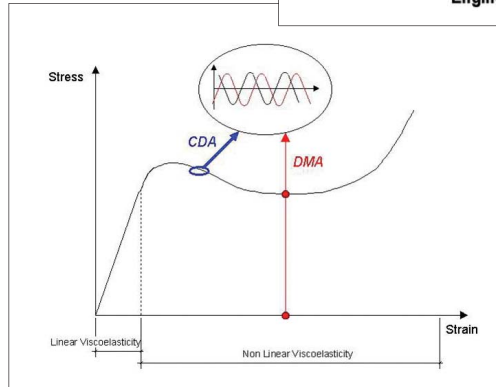
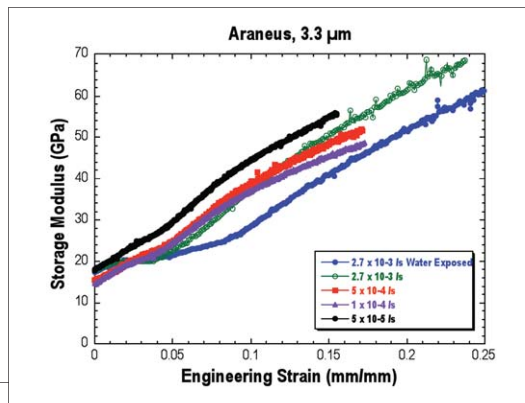


Figure 2. The T150 with the CDA option imposes a small oscillation on a material that is being simultaneously subjected to a variable quasi-static strain and can provide material properties over a range of strain in one experiment.

Agilent CDA Option Specifications

Force amplitude range	0.1 μ N to 4.5 mN
Frequency range characterization of instrument dynamic response (sample dependent)	0.01 Hz to 200 Hz

Nanoindentation instruments from Agilent Technologies conform to ISO 14577 and ASTM 2546 standards, delivering confidence in test accuracy and repeatability. These state-of-the-art solutions ensure reliable, high-precision measurement of nanomechanical properties for research and industry.

Product specifications and descriptions in this document subject to change without notice.

© Agilent Technologies, Inc. 2009
Printed in USA, June 10, 2009
5990-4207EN