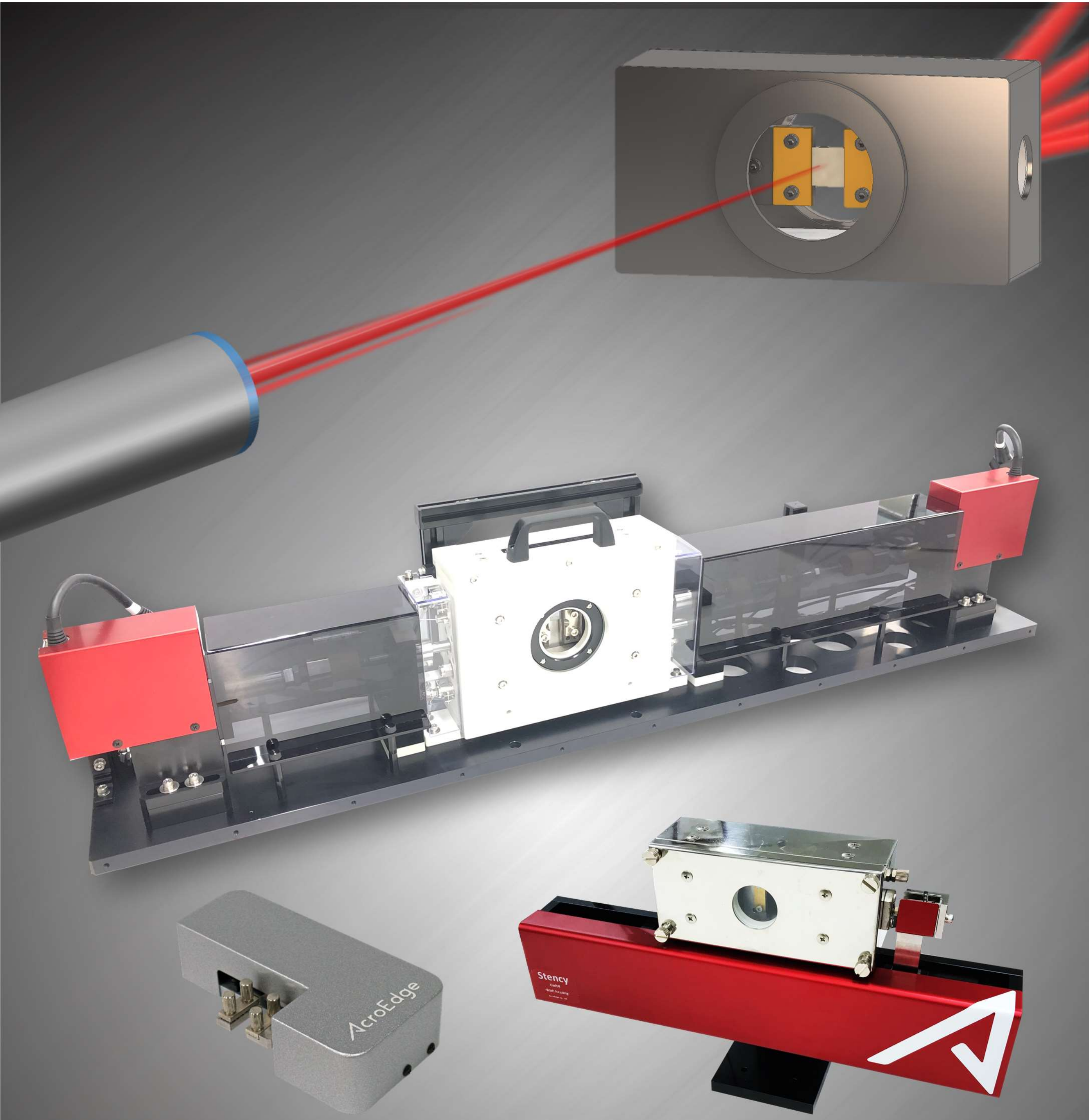
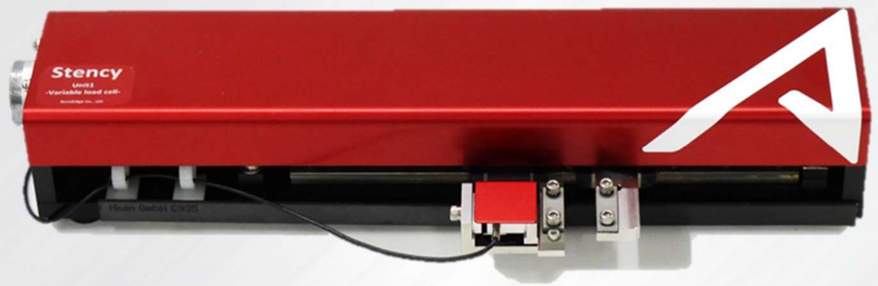
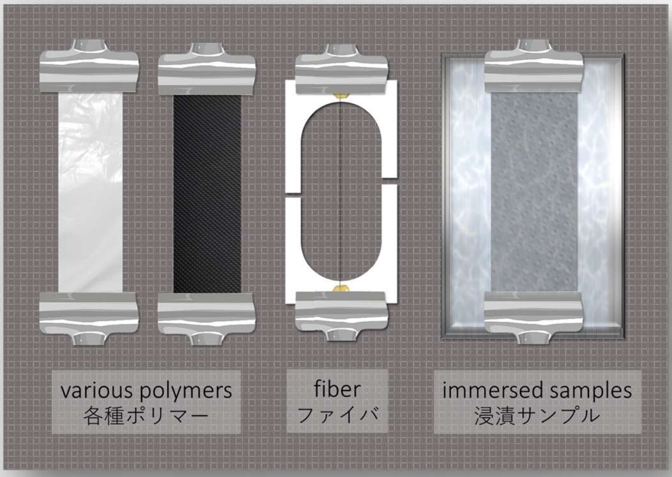


STENCY by AcroEdge

SYNCHROTRON & BEAMLINE TENSILE TESTERS



Stency, is a lightweight, compact, and modular tensile tester series capable of measuring the stress-strain behavior of various materials.

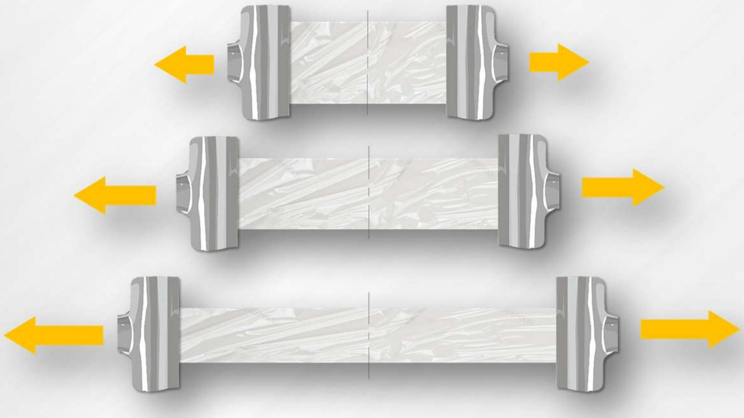


Variety of Sample Tests

Stency tensile testers are capable of measuring loads for small to moderate sample sizes of a wide range of materials. Delicate materials like carbon fibers, thin films, skin, and threads can also be tested.

Bidirectional Pull

Stency is unique from other tensile testers due to its bi-directional pull leaving **the center of the sample at a fixed position**. This ensures that the material experiences uniform tensile stress at the center.

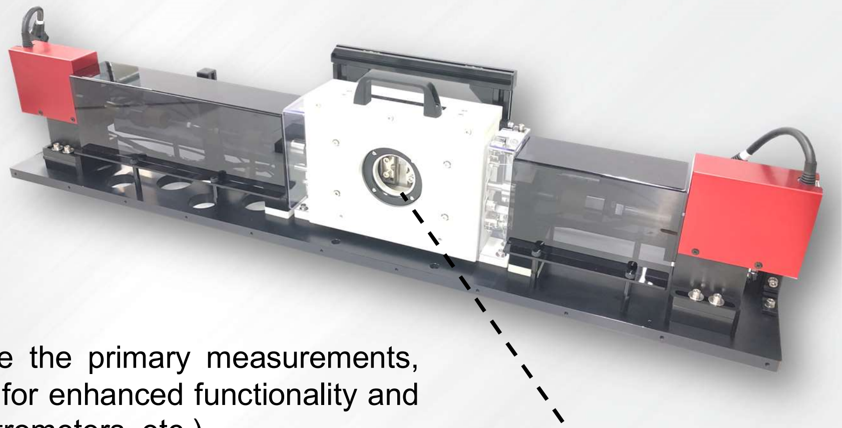


uniform stretching from both sides
sample center remains in fixed position
両側から均一にストレッチ
サンプルの中心は固定位置のままです

Customizable and Modular for Laboratory Environments

Stency is customizable for different types of tests and environments. Popular examples are shown here.

SYNCHROTRON STENCY

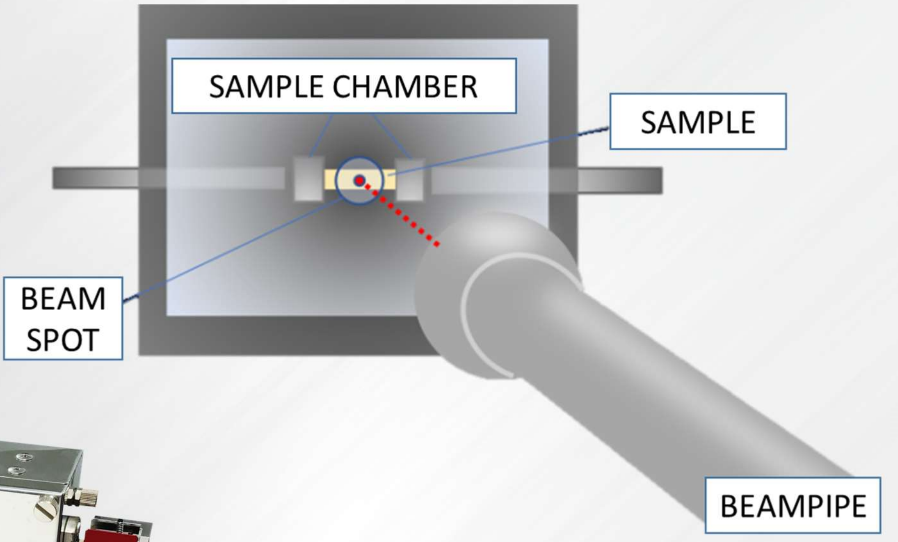


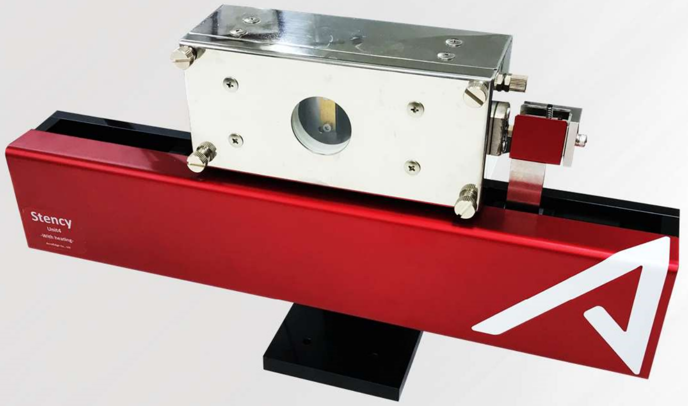
The Synchrotron & Beamline Stency is equipped with portholes for installation along a laser path or accelerator beamline. Here, beams of particles can be directed to impact the center of a sample while it is stretched.

Stress, strain, and temperature are the primary measurements, but other devices may be mounted for enhanced functionality and data collection. (e.g. cameras, spectrometers, etc.)

Sample Specifications	
Load Capacity	50 N/200 N
Min. Sample Length	10-15 mm
Stretch Range	90 mm
Stretching Speed	0.1-10 mm/s
Heating	Up to 200 °C
Tester Dimensions	W1100 x D150 x H150mm

The bi-directional pull of the Stency ensures that the irradiated spot stays in the center and undergoes uniform stretching on both sides. Any changes in the material's properties or structure can be analyzed





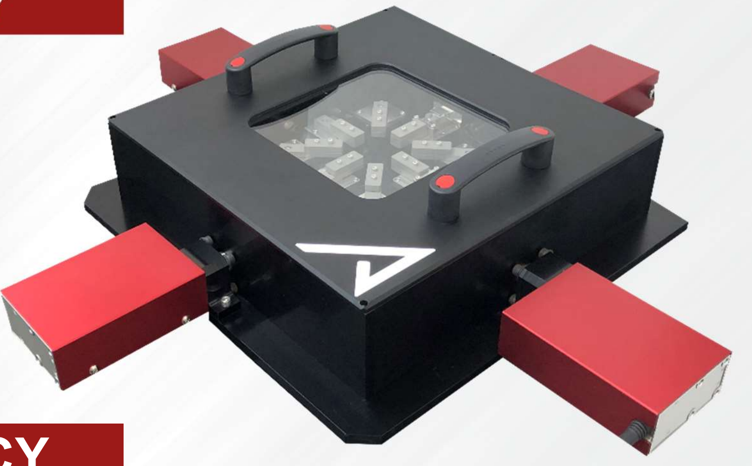
The Synchrotron & Beamline Stency can be customized as desired. Gas flow chambers, high or sub-zero (°C) temperature options are available.

Customizable and Modular for Laboratory Environments

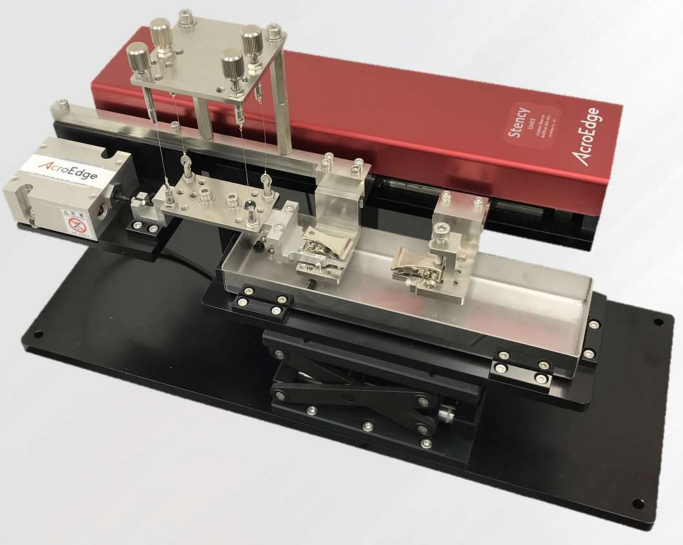
Several other designs of the Stency are offered for different types of experiments. Features can be combined and customized to fit client needs. For example, a Synchrotron Stency can be designed that is bi-axial with a chamber for Nitrogen gas flow at 150 °C.

BI-AXIAL STENCY

The bi-axial Stency uses 4 actuators and 8 sample clamps to stretch sheets or films of materials radially from the center. Typical load capacity designs for the bi-axial Stency include 200 N up to 1000 N.



IMMERSION STENCY



The Immersion Stency is used to measure the tensile strength of materials in liquid environments. These can range from simple water to highly reactive chemicals. This type of tester finds application in medical research, materials development, chemical industries, and other relevant fields.

GAS FLOW STENCY

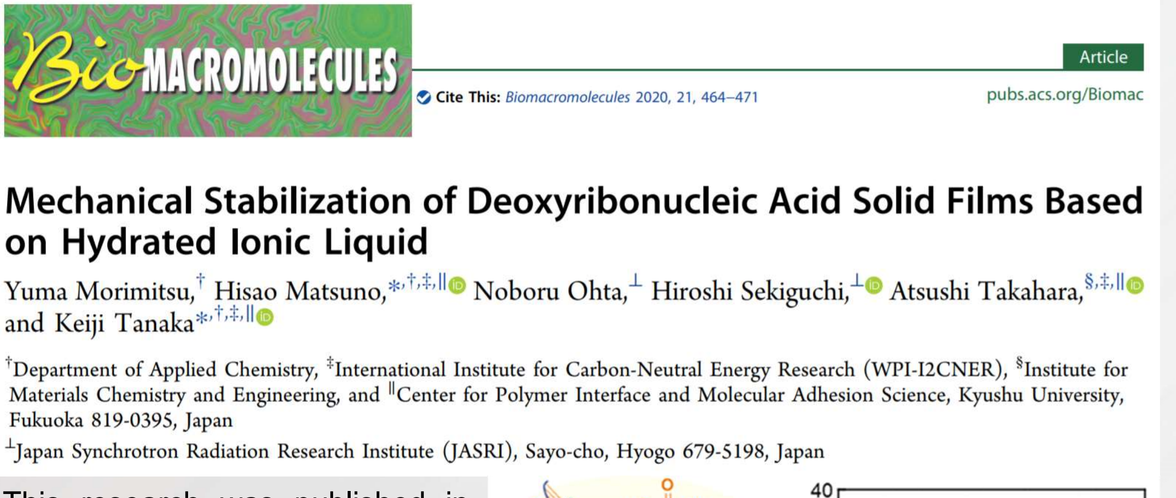
Gas Flow Stency testers are equipped with gas inlets and outlets to allow testing of materials under the effect of different gaseous environments. These typically include gases like nitrogen and argon.

AcroEdge

User Interface & Controls

Stency systems come with a control unit and computer. The GUI for data acquisition and control is easy to use, easy to understand, and versatile. Customizations and added functionality are dependent on the exact Stency design.

Stency in Literature



BIOMACROMOLECULES

Article

Cite This: *Biomacromolecules* 2020, 21, 464–471

pubs.acs.org/Biomac

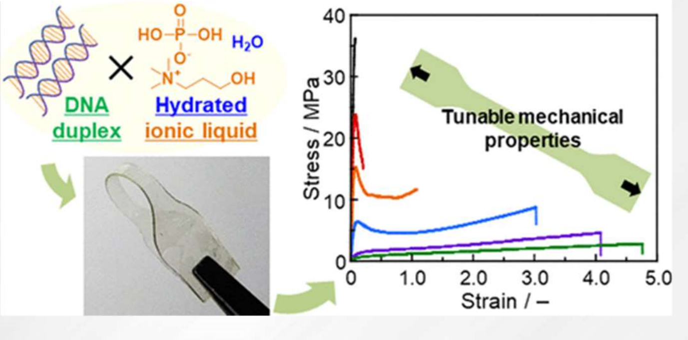
Mechanical Stabilization of Deoxyribonucleic Acid Solid Films Based on Hydrated Ionic Liquid

Yuma Morimitsu,[†] Hisao Matsuno,[*,†,‡,∥] Noboru Ohta,[⊥] Hiroshi Sekiguchi,[⊥] Atsushi Takahara,[§,‡,∥] and Keiji Tanaka[*,†,‡,∥]

[†]Department of Applied Chemistry, [‡]International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), [§]Institute for Materials Chemistry and Engineering, and [∥]Center for Polymer Interface and Molecular Adhesion Science, Kyushu University, Fukuoka 819-0395, Japan

[⊥]Japan Synchrotron Radiation Research Institute (JASRI), Sayo-cho, Hyogo 679-5198, Japan

This research was published in the journal Biomacromolecules by researchers at Kyushu University and the Japan Synchrotron Radiation Research Institute (JASRI/Spring-8). An AcroEdge Stency equipped with a camera and Wide-Angle X-Ray Diffraction instrument is used.



AcroEdge

Stency in Literature

The following research was published in the January 2020 edition of the journal Chemical Communications by the Okinawa Institute of Science and Technology Graduate University (OIST) in Japan, and the Russian Academy of Sciences. The AcroEdge Stency is used to center-stretch a mechanoresponsive polymer that produces luminescence when strained.

ChemComm

Cite this: *Chem. Commun.*, 2020, 56, 50

Received 25th October 2019, Accepted 18th November 2019

DOI: 10.1039/c9cc08354e

rsc.li/chemcomm

Highly sensitive mechano-controlled luminescence in polymer films modified by dynamic Cu^{I}-based cross-linkers†

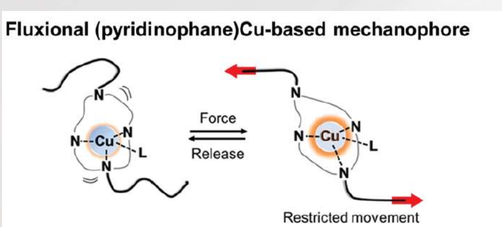
Ayumu Karimata, ‡[a] Pradnya H. Patil, ‡[a] Eugene Khaskin, [a] Sébastien Lapointe, [a] Robert R. Fayzullin, [b] Pavlos Stampoulis[c] and Julia R. Khusnutdinova *[a]

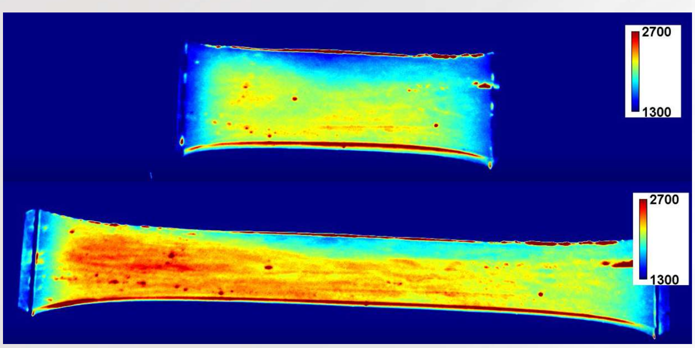
[a] *Coordination Chemistry and Catalysis Unit, Okinawa Institute of Science and Technology Graduate University, 1919-1 Tancha, Onna-son, Okinawa, 904-0495, Japan. E-mail: juliak@oist.jp*

[b] *Arbuzov Institute of Organic and Physical Chemistry, FRC Kazan Scientific Center, Russian Academy of Sciences, 8 Arbuzov Street, Kazan, 420088, Russia*

[c] *JEOL RESONANCE Inc., Musashino, Akishima, Tokyo, 196-8558, Japan*

Dynamic Cu^{I}-based mechanophores used as cross-linkers in poly-butylacrylates enable highly sensitive detection of mechanical stress even at small strain (<50%) and stress (<0.1 MPa) values *via* reversible changes in luminescence intensity. Such sensitivity is superior to previously reported systems based on classical organic mechanophores and it allows for direct visualization of mechanical stress by imaging methods.





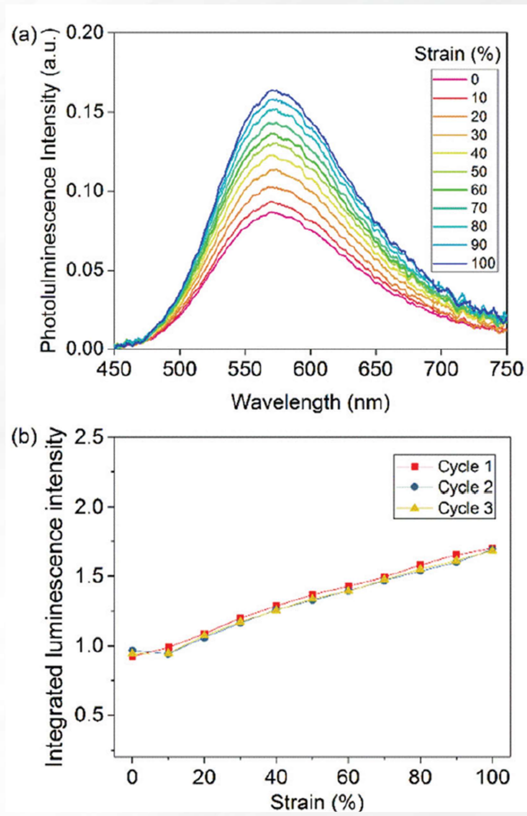
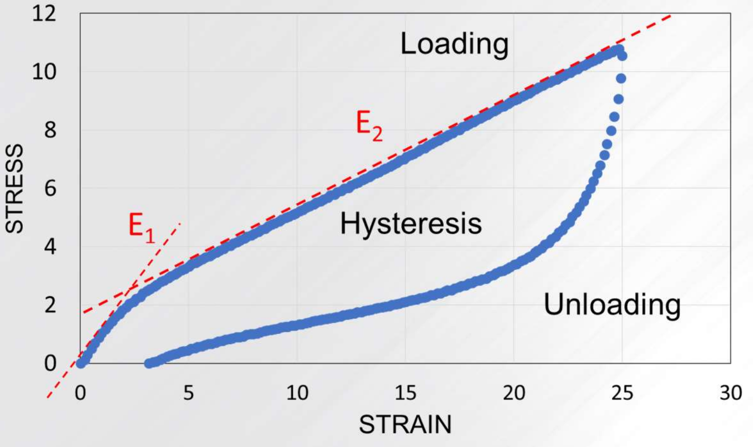


Fig. 1 (a) Emission spectra of **Cu1-cPBA** during stretching. (b) Plot of integrated photoluminescence intensity *vs.* strain of **Cu1-cPBA**.

AcroEdge

The Stress-Strain Curve

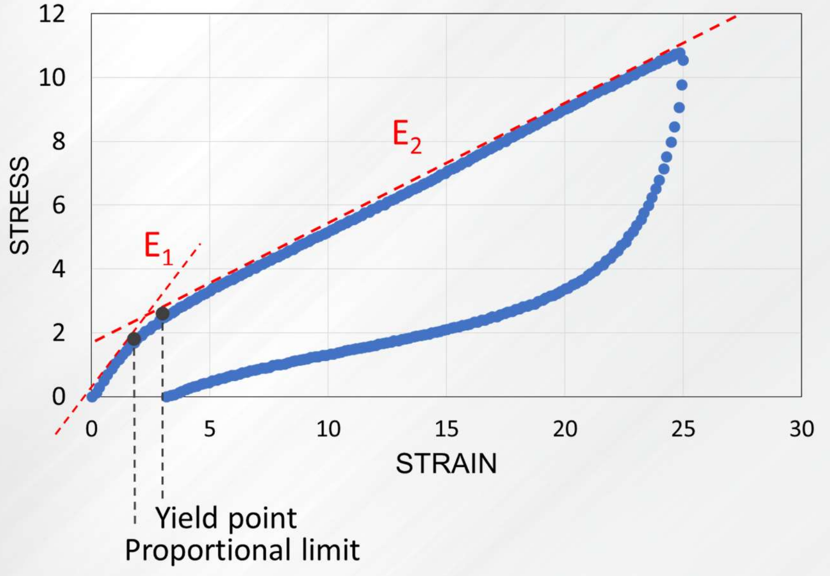


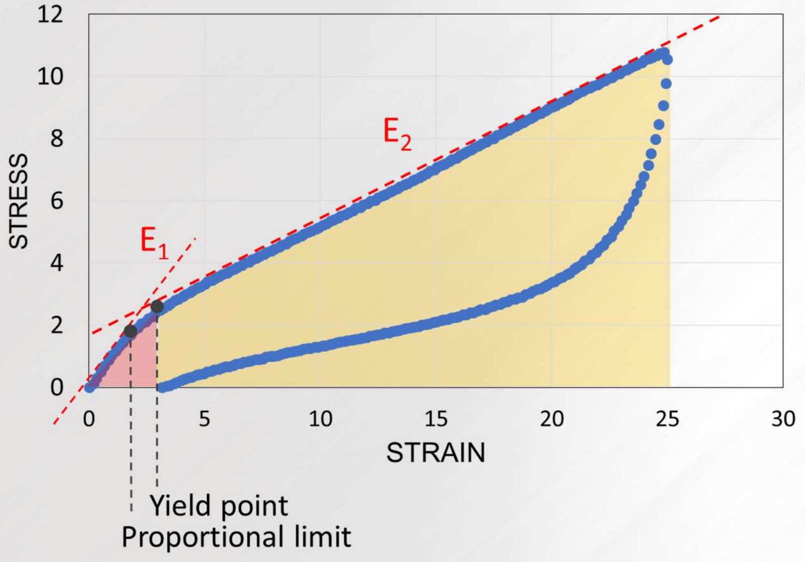
Loading
Material behavior when applied with tensile stress (i.e. stretched).

Unloading
Material behavior when stress is removed.

Proportional Limit is the highest stress at which stress is directly proportional to strain.
When material is unloaded at this position, the material goes back to its original length.

Yield Point is the point at which material transitions from elastic to plastic deformation. Material experiences permanent deformation.





Elastic Region

Region at which material still reverts to its original state when stress is removed.

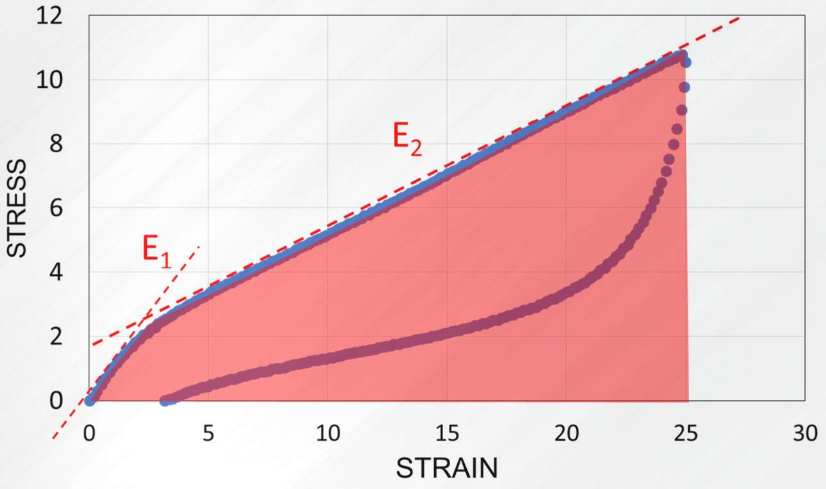
Plastic Region

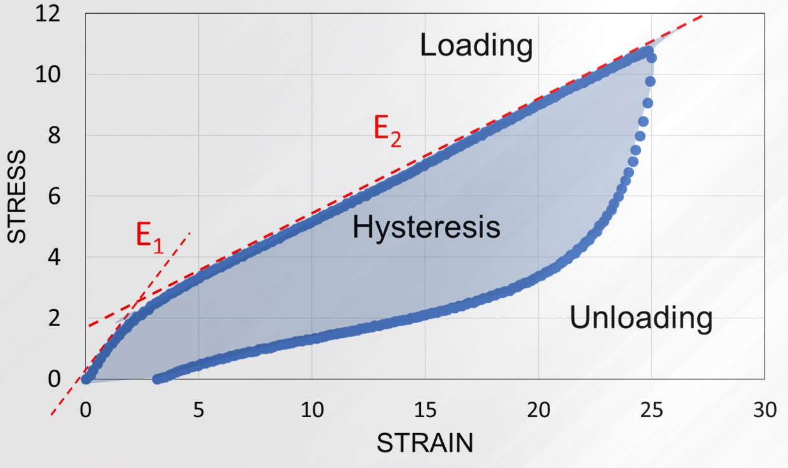
Region at which material experiences permanent deformation.

Areas under the Stress-Strain Curve

Toughness, area under the loading curve.

Energy absorbed as a result of applying a force to deform an elastic object



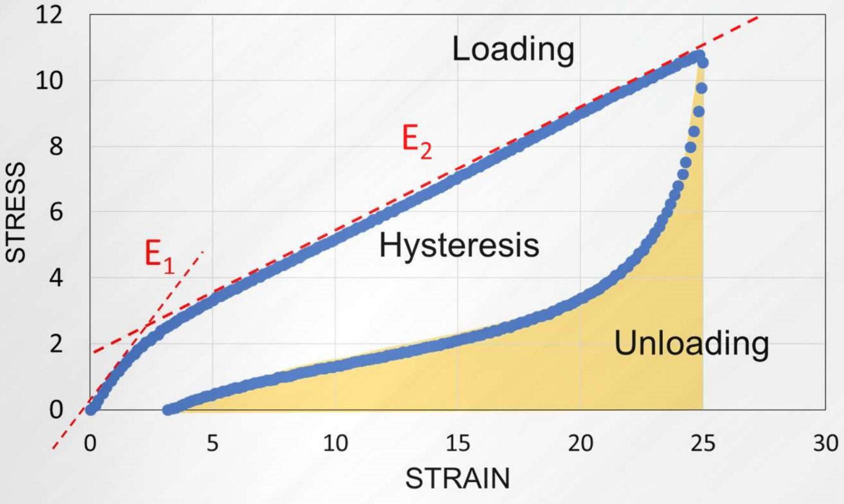


Heat Energy, area of hysteresis.

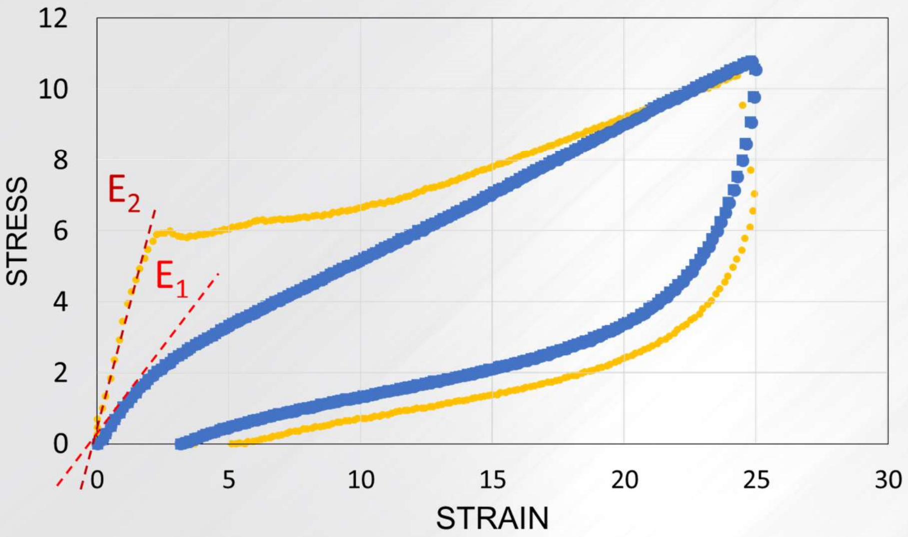
Energy released as a result of applying a force to deform an elastic object

Elastic Potential Energy, area under the unloading curve.

Energy stored as a result of applying a force to deform an elastic object



Sample Data Analysis of Various Rubbers



Nitrile Butyl Rubber

Ethylene Propylene Rubber

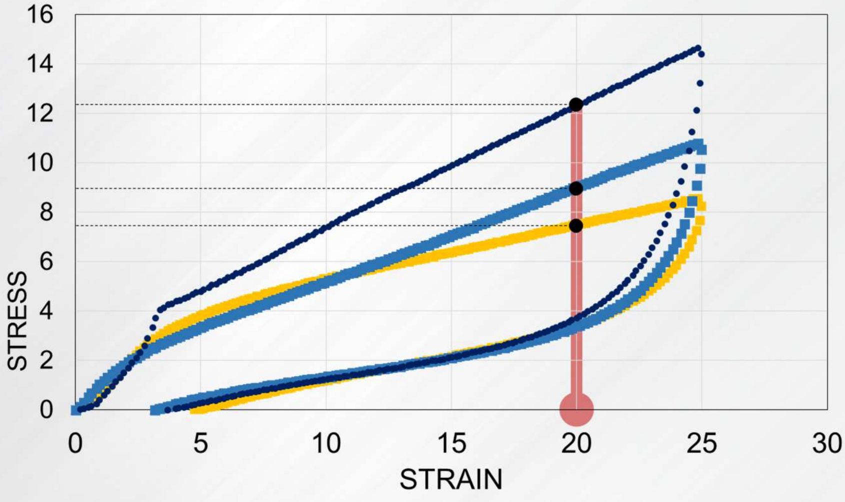
$$E = \frac{stress}{strain}$$

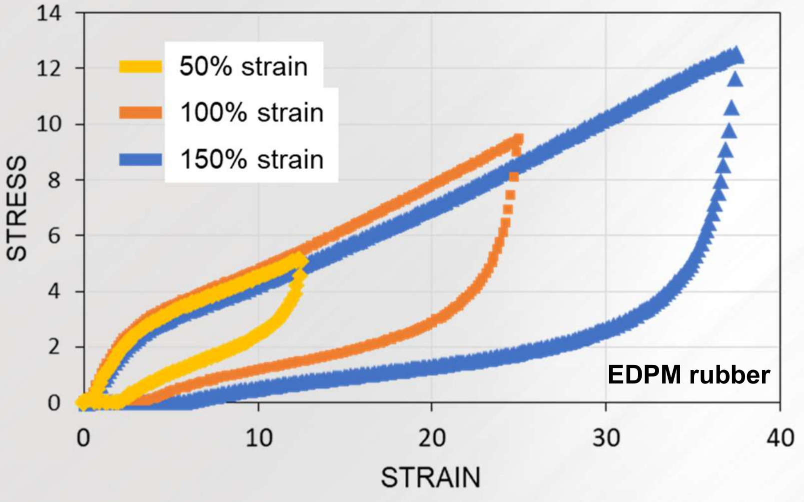
Elastic Modulus, E
Resistance degree of material to elastic deformation when applied with stress.

Higher slope in the SS curve corresponds to higher stiffness of the material. In this figure, ethylene propylene rubber has higher stiffness than nitrile butyl rubber.

Chlorophrene Rubber
Nitrile Butadiene Rubber
Butyl Rubber

Higher stress experienced by the material during elongation signifies greater resistance to deformation, i.e. higher stiffness. Chlorophrene rubber has the highest stiffness as compared to the other sample.

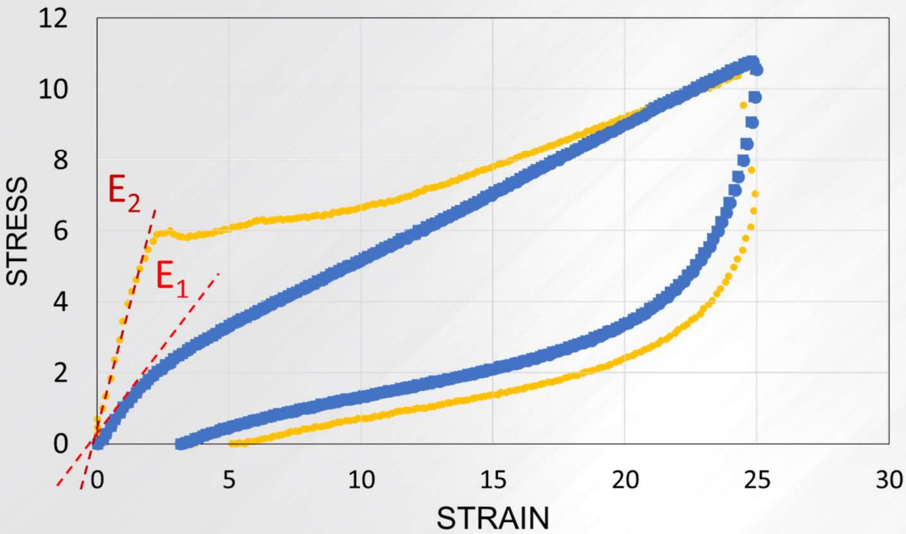




Hysteresis Behavior
The hysteresis behavior of EDPM shows the energy loss at different %strain.

AcroEdge

Sample Data Analysis of Various Rubbers



Nitrile Butyl Rubber

Ethylene Propylene Rubber

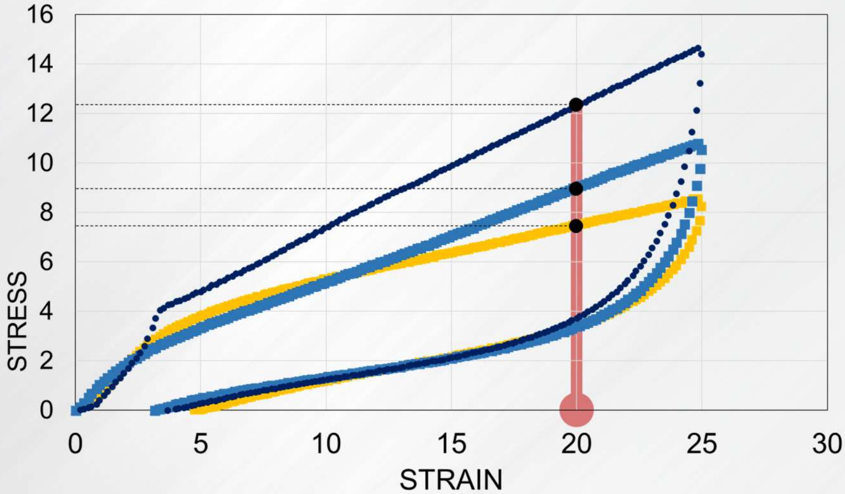
$$E = \frac{stress}{strain}$$

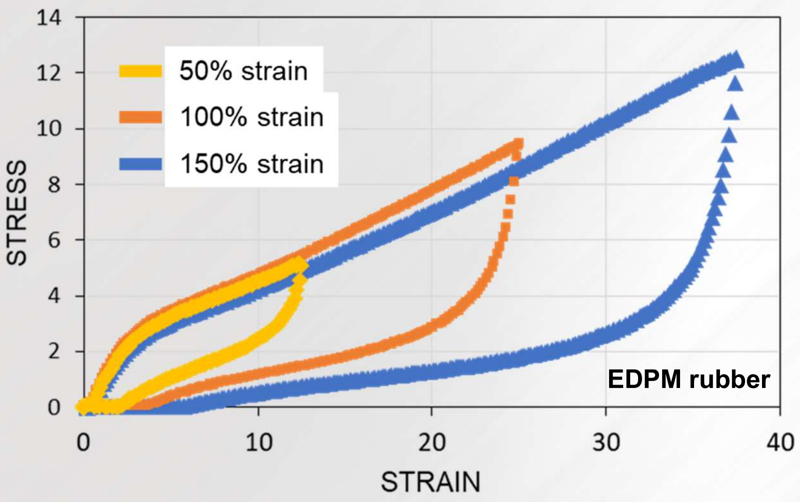
Elastic Modulus, E
Resistance degree of material to elastic deformation when applied with stress.

Higher slope in the SS curve corresponds to higher stiffness of the material. In this figure, ethylene propylene rubber has higher stiffness than nitrile butyl rubber.

Chlorophrene Rubber
Nitrile Butadiene Rubber
Butyl Rubber

Higher stress experienced by the material during elongation signifies greater resistance to deformation, i.e. higher stiffness. Chlorophrene rubber has the highest stiffness as compared to the other sample.



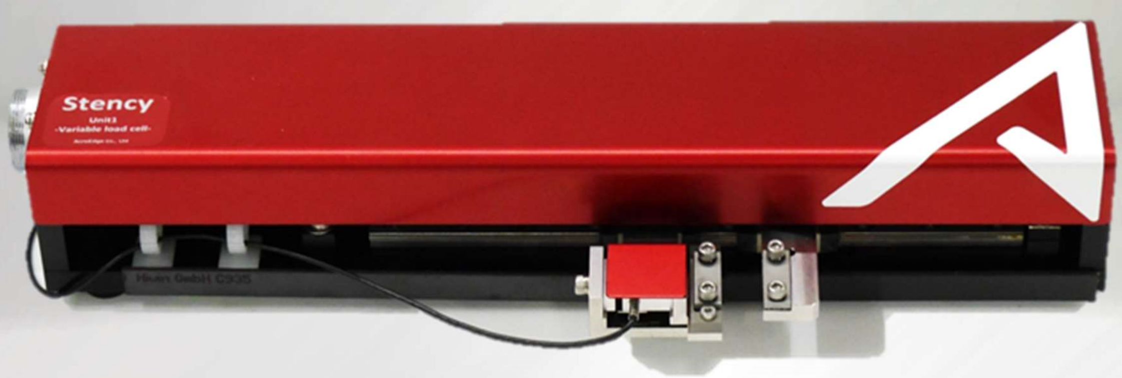


Hysteresis Behavior
The hysteresis behavior of EDPM shows the energy loss at different %strain.

AcroEdge

STENCY by AcroEdge

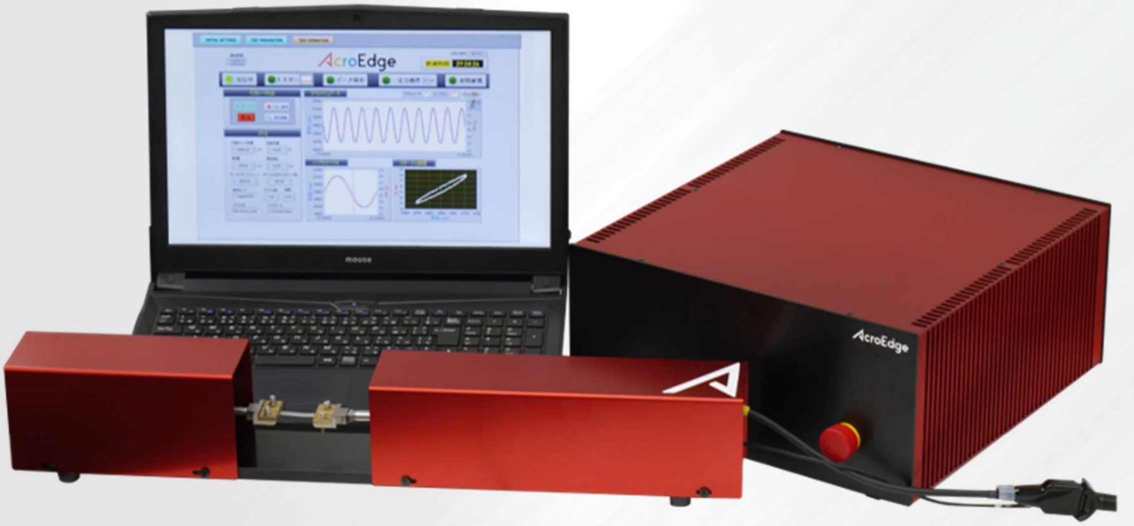
COMPACT & LIGHTWEIGHT
TENSILE TESTER



>> CHECK OUT OUR NEW FATIGUE TESTER!

SYCLUS by AcroEdge

A COMPACT FATIGUE TESTER FOR POLYMERS & COMPOSITES



AcroEdge

For more information, visit us at **https://www.acroedge.co.jp**

Tel: **+81-72-836-0031** | E-mail: **office@acroedge.co.jp**
(English support is available.)

AcroEdge Co., Ltd., 1-70-1 Nagao Tanimachi, Hirakata City, Osaka, Japan 573-0164

Copyright © 2020 AcroEdge Co., Ltd.