Modulus Measurement of Kedi Scintillators

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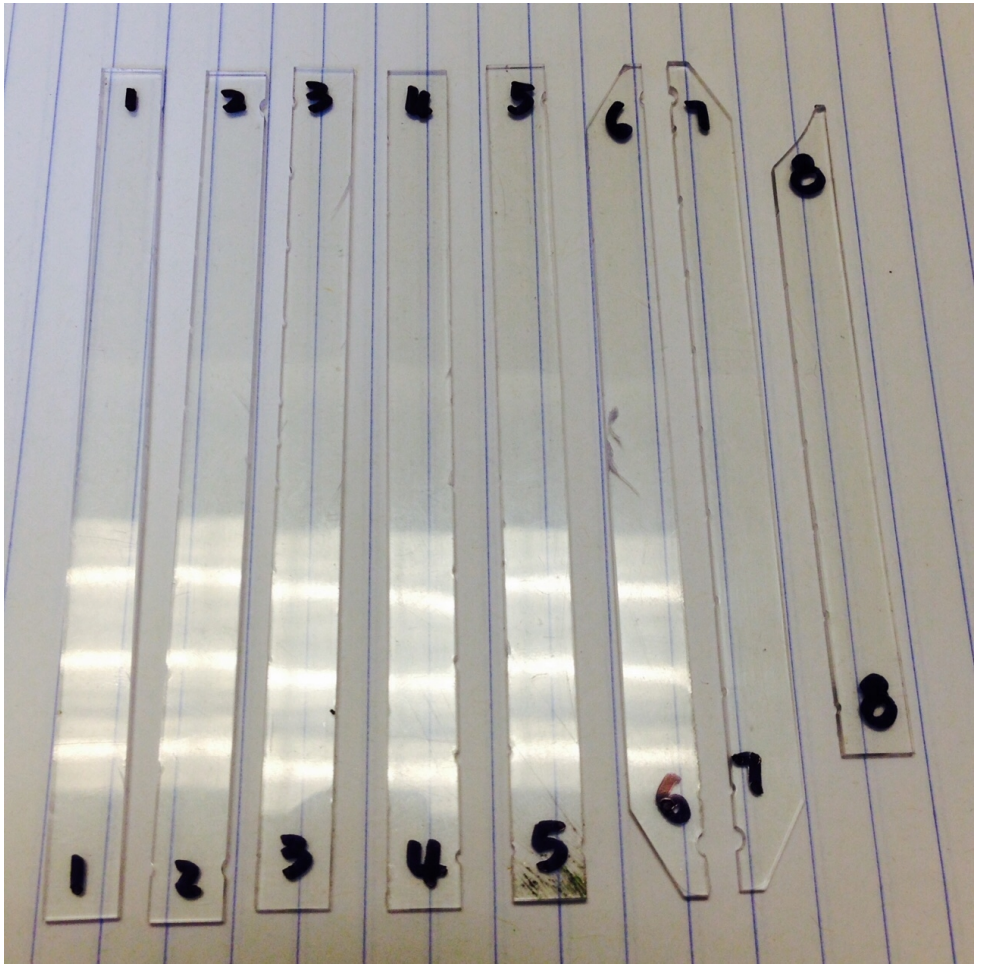
UVa

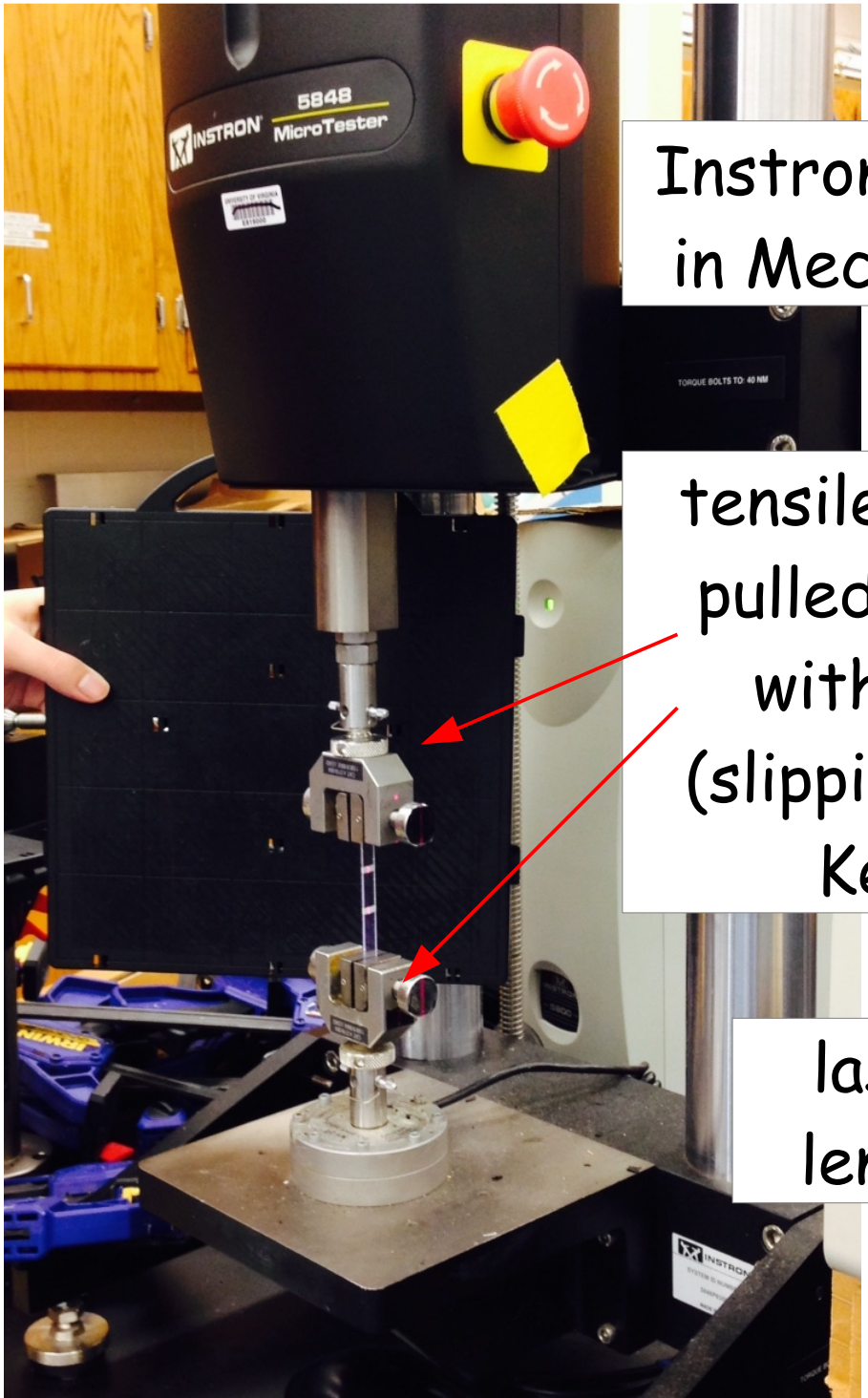
2016/2/4

Sample Preparation



Cut one shashlyk piece to make 8 samples, cross-section (1.52±0.02) by (8.06±0.03)mm

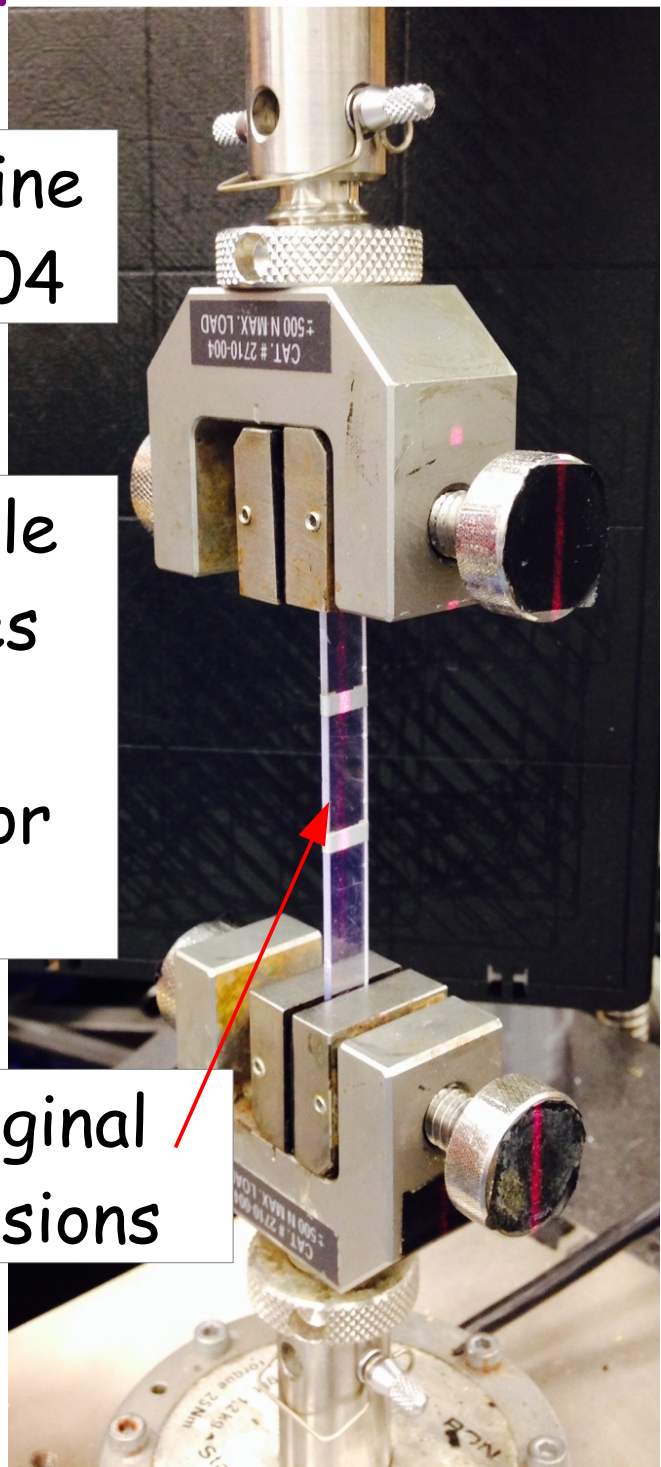
Tensile Testing Setup



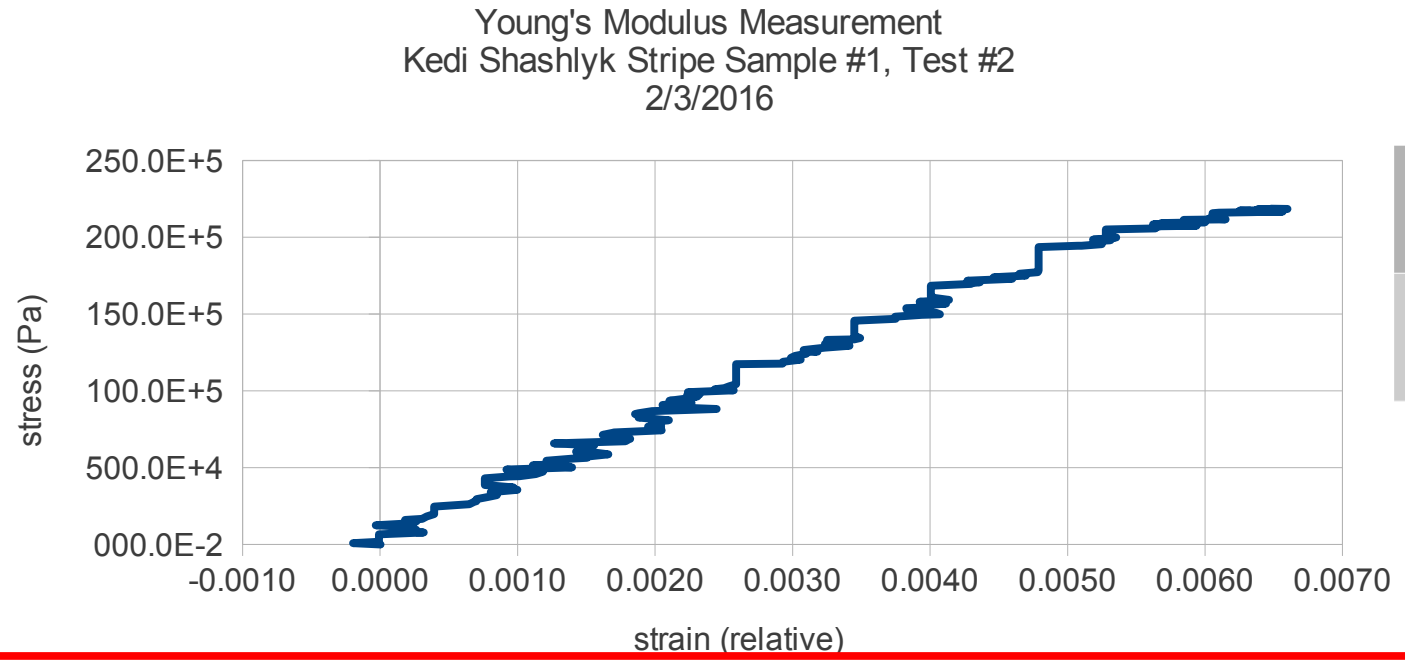
Instron testing machine in Mech. Eng. room 104

tensile testing: sample pulled by two handles with force sensor (slipping happened for Kedi samples)

laser reading original length and extensions

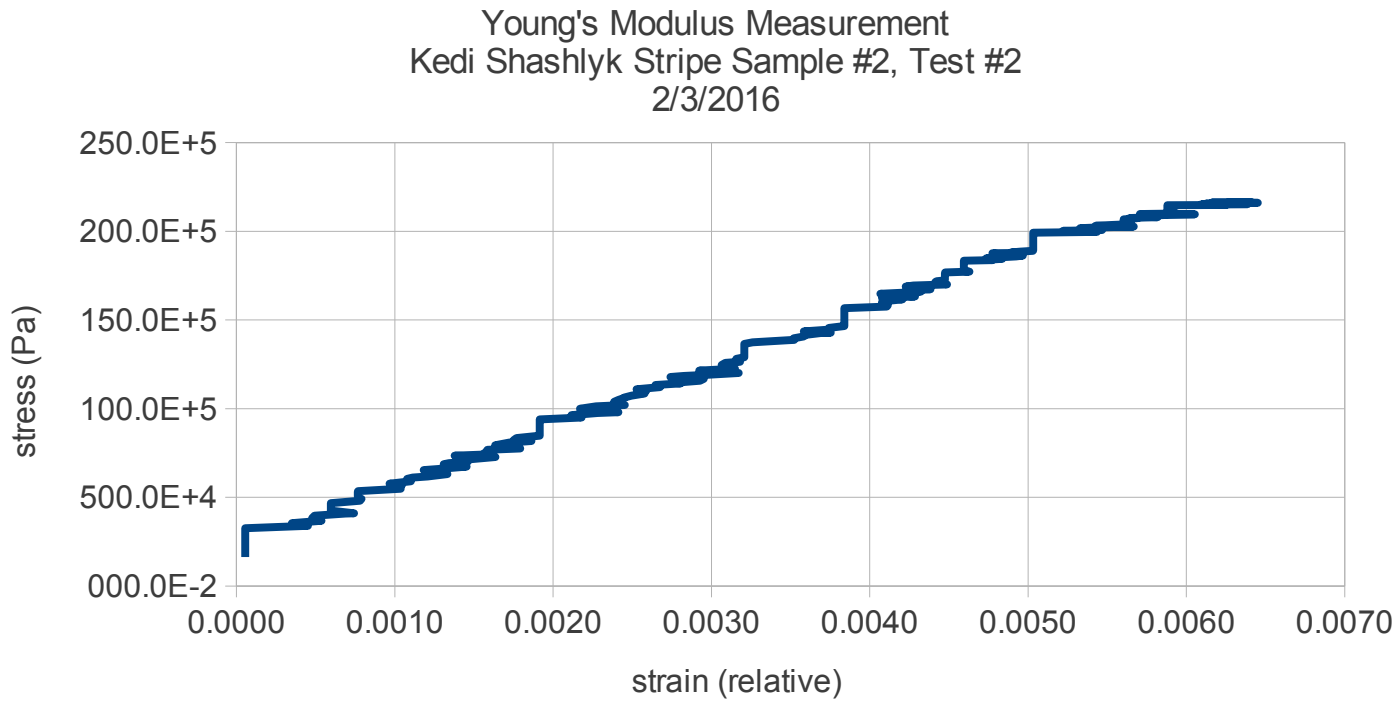


Shashlyk Stripe Sample Tensile Test Results (did not reach failure due to slipping)



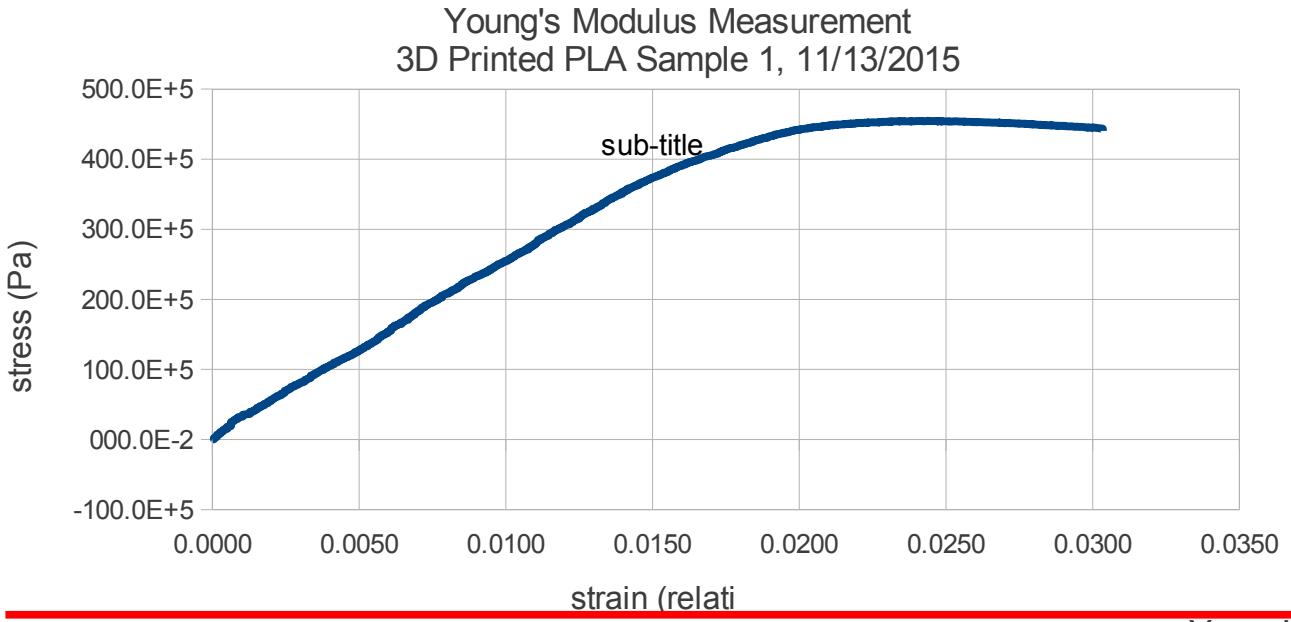
Young's modulus (MPa)	3230.91
tensile strength (MPa)	>22

Young's modulus (MPa)	3031.50
tensile strength (MPa)	>20



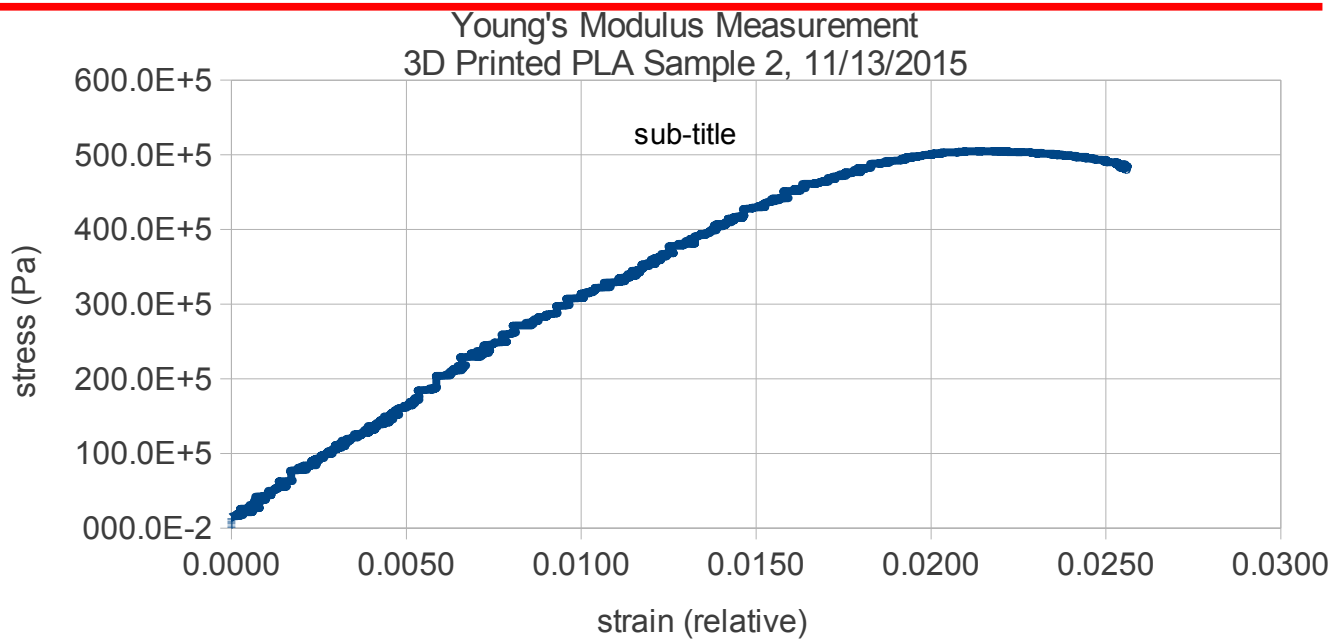
Web data (metweb.com) for polysterene: tensile modulus 3GPa; ultimate tensile strength 40MPa.

Control Measurement using 3D-Printed PLA (failure reached)



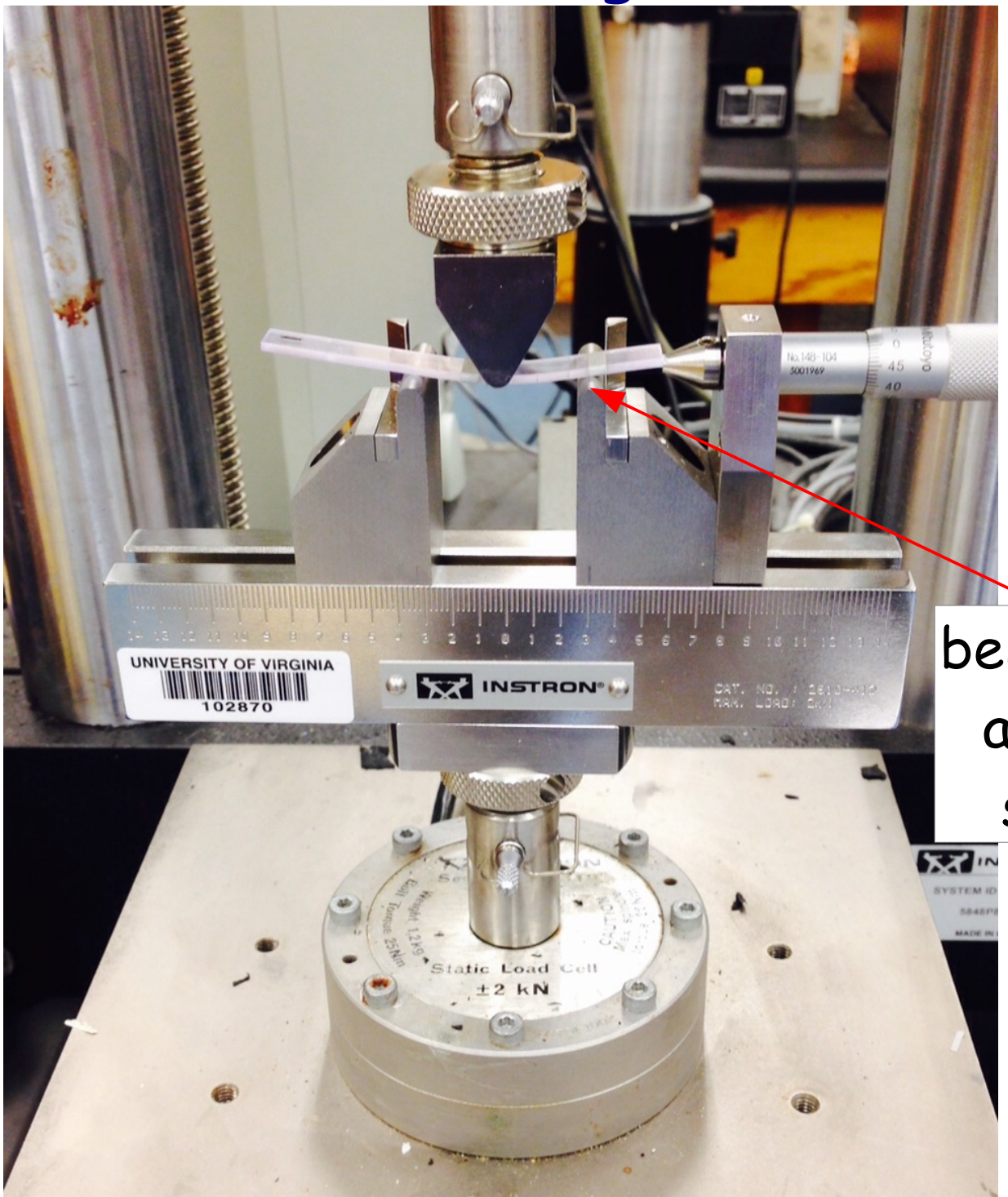
Young's modulus (MPa)	2493.12
tensile strength (MPa)	44.06
strain at tensile strength	0.030

Young's modulus (MPa)	2833.69
tensile strength (MPa)	47.77
strain at tensile strength	0.026



Published data: tensile modulus (3.2-3.5)GPa; ultimate tensile strength (48-60)MPa. – B.M.Tymrak et al. Materials and Design 58 (2014) 242-246

3-Point Bending (Flexural) Testing Setup



bending (shear) test: load applied to mid point of sample until breaking

Web Data for Polysterene (matweb.com)

- tensile modulus 3 GPa; tensile ultimate strength 40MPa
- flexural modulus 2.5 GPa; flexural strength 70MPa
- compressive modulus 2.5 GPa; compressive yield strength 70MPa