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Introduction

- The machine used was the Netzsch DMA Eplexor.
- The film used within the tests was Kapton film.
- The main focus was to use the DMA as a Universal tester, it was used to compare break strength versus
 - Strain rate
 - Temperature (high)

Break Strength vs. Strain Rate

- This test is one of the most important things that a Universal Tester can do, the ability to do this is very important for the success of the DMA.
- The success of this test affirmed the viability of the DMA.
 - With the DMA being successful other tests could be done both using high temperatures and sub ambient temperatures, the latter tests **use much less liquid nitrogen per test** compared to an Instron.

Break Strength vs. Strain Rate Graph

- Example of Break strength vs. Strain rate

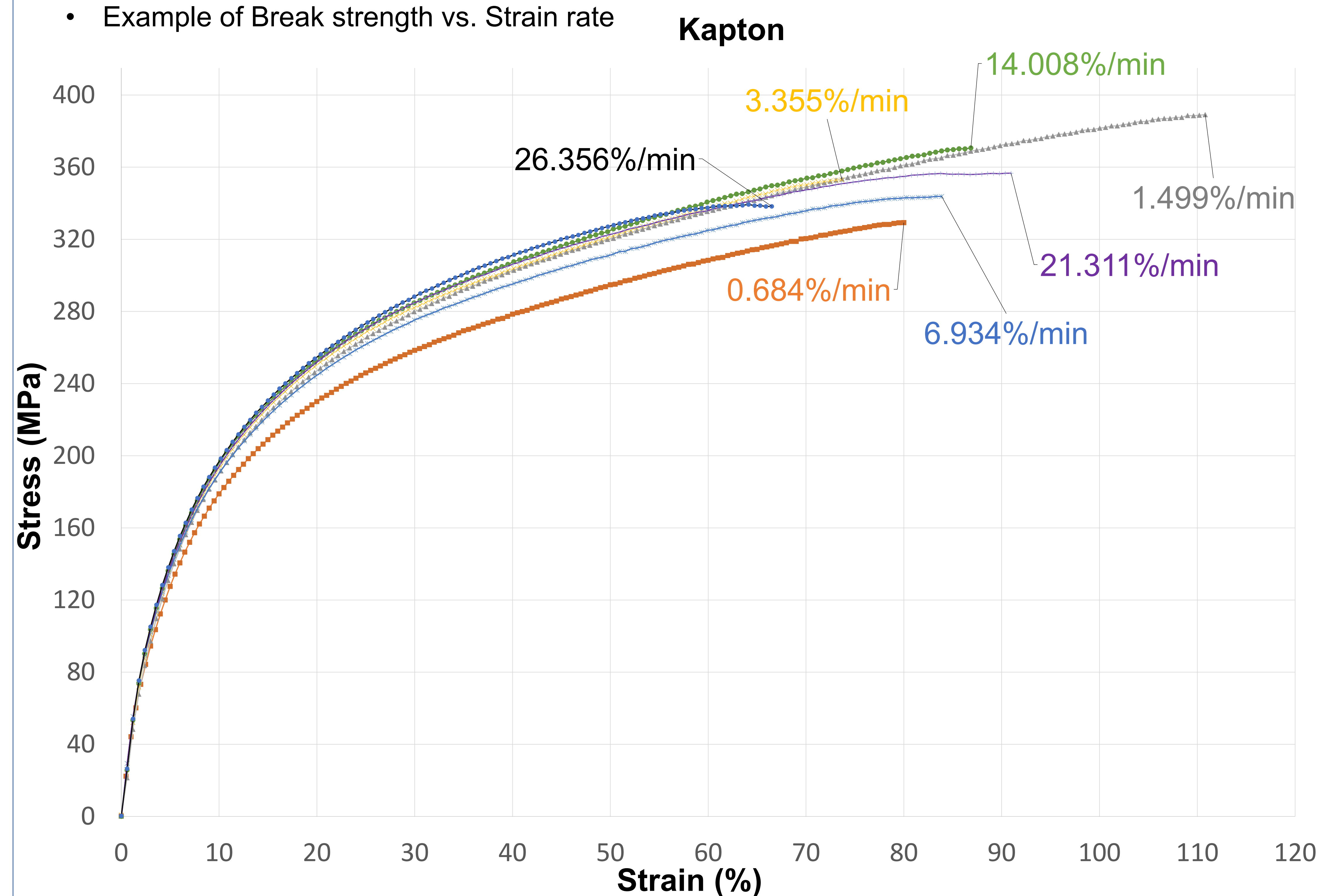


Table Containing Strain, Stress, and Temperature

Temp C	Strain rate %/min	Stress (MPa)
Ambient (≈ 25)	(various, values from graph)	354.538
75	6.184	184.857
100	6.865	162.673
200	14.091	134.103
200	0.685	213.873
Dupont's figures		
22.778	Unknown	231
200	Unknown	139

Possible Future Studies

- One of the possible things to do with the DMA is to do break strength vs. sub ambient temperatures, this is mentioned in section 1 but no data is included from this, there were test with this idea but the 500 N motor must be installed for best results (the 150 N is the one currently being used for these tests, it was often maxed out).
- The other possible thing is break strength vs. relative humidity, this is not something that has previously been tested unlike sub ambient temperatures.
- In the future other materials should be used and tested on to ensure it truly is a good mechanical tester for a wide range of films, the only confirmed film is Kapton.
- The only type of experiment done was a pull to break for the data received, in the future other tests including compression can be done as well.

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